Logon

*** It is now 1/25/08 4:31:32 PM ***

Welcome to DialogLink - Version 5
Revolutionize the Way You Work!

New on Dialog

New Chinese Patent Data in Derwent World Patents Index

Effective November 1, 2007, English-language translations for Chinese Utility Model registrations are now available in *Derwent World Patents Index First View* on *Dialog* (File 331) and *Derwent World Patents Index (DWPI)* (File 350, 351,352), beginning with records published on October 3, 2007.

All Chinese Utility Model registration records in *Derwent World Patents Index First View*SM feature:

- Bibliographic fields including patent number, filing date, IPCs, inventor and assignee names
- Patentee code
- English translation of the author's title, abstract and first claim (all records are human translated)

The Utility numbers will be formatted as follows:

CN20NNNNNNNY
20 = IP right (indicating a utility model) followed by 7-digit serial no. Utility Models have the status Y

DialogLink 5 Release Notes

New features available in the latest release of DialogLink 5 (August 2006)

- Ability to resize images for easier incorporation into DialogLink Reports
- New settings allow users to be prompted to save Dialog search sessions in the format of their choice (Microsoft Word, RTF, PDF, HTML, or TEXT)
- Ability to set up Dialog Alerts by Chemical Structures and the addition of Index Chemicus as a structure searchable database
- Support for connections to STN Germany and STN Japan services

Show Preferences for details

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? Help Off Line

* * *

Connecting to Rob Pond - Dialog - 264751

Connected to Dialog via SMS003072288


?  B 15, 9, 610, 810, 275, 476, 624, 621, 636, 613, 813, 16, 160, 634, 148, 20, 35, 583,
65, 2, 474, 475, 99, 256, 348, 349, 347, 635, 570, PAPERSMJ, PAPERSEU, 47
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[File 15] ABI/Inform(R) 1971-2008/Jan 25
(c) 2008 ProQuest Info&Learning. All rights reserved.

[File 9] Business & Industry(R) Jul/1994-2008/Jan 23
(c) 2008 The Gale Group. All rights reserved.

[File 610] Business Wire 1999-2008/Jan 25
(c) 2008 Business Wire. All rights reserved.
**File 610: File 610 now contains data from 3/99 forward. Archive data (1986-2/99) is available in File 810.*

[File 810] Business Wire 1986-1999/Feb 28
(c) 1999 Business Wire . All rights reserved.

[File 275] Gale Group Computer DB(TM) 1983-2008/Jan 23
(c) 2008 The Gale Group. All rights reserved.

[File 476] Financial Times Fulltext 1982-2008/Jan 24
(c) 2008 Financial Times Ltd. All rights reserved.

[File 624] McGraw-Hill Publications 1985-2008/Jan 25
(c) 2008 McGraw-Hill Co. Inc. All rights reserved.
**File 624: Homeland Security & Defense and 9 Platt energy journals added Please see HELP NEWS624 for more*

[File 621] Gale Group New Prod.Annou.(R) 1985-2008/Jan 11
(c) 2008 The Gale Group. All rights reserved.

[File 636] Gale Group Newsletter DB(TM) 1987-2008/Jan 24
(c) 2008 The Gale Group. All rights reserved.

[File 613] PR Newswire 1999-2008/Jan 25
(c) 2008 PR Newswire Association Inc. All rights reserved.
**File 613: File 613 now contains data from 5/99 forward. Archive data (1987-4/99) is available in File 813.*

[File 813] PR Newswire 1987-1999/Apr 30
(c) 1999 PR Newswire Association Inc. All rights reserved.

[File 16] Gale Group PROMT(R) 1990-2008/Jan 15
(c) 2008 The Gale Group. All rights reserved.
**File 16: Because of updating irregularities, the banner and the update (UD=) may vary.*

[File 160] Gale Group PROMT(R) 1972-1989
(c) 1999 The Gale Group. All rights reserved.

[File 634] San Jose Mercury Jun 1985-2008/Jan 23

[File 148] Gale Group Trade & Industry DB 1976-2008/Jan 10

File 148: The CURRENT feature is not working in File 148. See HELP NEWS148.

[File 20] Dialog Global Reporter 1997-2008/Jan 25

[File 35] Dissertation Abs Online 1861-2007/Oct

[File 583] Gale Group Globalbase(TM) 1986-2002/Dec 13

File 583: This file is no longer updating as of 12-13-2002.

[File 65] Inside Conferences 1993-2008/Jan 25

[File 2] INSPEC 1898-2008/Dec W4

[File 474] New York Times Abs 1969-2008/Jan 25

[File 475] Wall Street Journal Abs 1973-2008/Jan 25

[File 99] Wilson Appl. Sci & Tech Abs 1983-2007/Nov

[File 256] TecInfoSource 82-2008/Oct

[File 348] EUROPEAN PATENTS 1978-2007/ 200804

File 348: For important information about IPCR/8 and forthcoming changes to the IC= index, see HELP NEWSIPCR.

[File 349] PCT FULLTEXT 1979-2008/UB=20080117UT=20080110

File 349: For important information about IPCR/8 and forthcoming changes to the IC= index, see HELP NEWSIPCR.

[File 347] JAPIO Dec 1976-2007/Sep(Updated 080116)

[File 635] Business Dateline(R) 1985-2008/Jan 24

[File 570] Gale Group MARS(R) 1984-2008/Jan 24

[File 387] The Denver Post 1994-2008/Jan 23

[File 471] New York Times Fulltext 1980-2008/Jan 29

[File 492] Arizona Repub/Phoenix Gaz 19862002/Jan 06

**File 492: File 492 is closed (no longer updating). Use Newsroom, Files 989 and 990, for current records.*

[File 494] St LouisPost-Dispatch 1988-2008/Jan 24

[File 631] Boston Globe 1980-2008/Jan 25

[File 633] Phil.Inquirer 1983-2008/Jan 25

[File 638] Newsday/New York Newsday 1987-2008/Jan 24

[File 640] San Francisco Chronicle 1988-2008/Jan 25

[File 641] Rocky Mountain News Jun 1989-2008/Jan 25

[File 702] Miami Herald 1983-2008/Jan 13

[File 703] USA Today 1989-2008/Jan 24

[File 704] (Portland)The Oregonian 1989-2008/Jan 24

[File 713] Atlanta J/Const. 1989-2008/Jan 24

[File 714] (Baltimore) The Sun 1990-2008/Jan 25

[File 715] Christian Sci.Mon. 1989-2008/Jan 22

[File 725] (Cleveland)Plain Dealer Aug 1991-2008/Jan 23

[File 735] St. Petersburg Times 1989- 2008/Jan 24

[File 477] Irish Times 1999-2008/Jan 25

[File 710] Times/Sun.Times(London) Jun 1988-2008/Jan 24

[File 711] Independent(London) Sep 1988-2006/Dec 12

**File 711: Use File 757 for full current day's news of the Independent, as as well as full coverage of many additional European news sources.*

[File 756] Daily/Sunday Telegraph 2000-2008/Jan 24

[File 757] Mirror Publications/Independent Newspapers 2000-2008/Jan 25

[File 47] Gale Group Magazine DB(TM) 1959-2008/Jan 18


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>>>W: One or more prefixes are unsupported

  or undefined in one or more files.

S1   79831588   S PD<20001016

? s ((optimize or optimizes or optimized or optimum or optimally or optimizing or optimization)(5n)(profit or profitablity))

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       113273   OPTIMIZES

       685581   OPTIMIZED

       773721   OPTIMUM

       133865   OPTIMALLY

       333769   OPTIMIZING

       783053   OPTIMIZATION

      7366658   PROFIT

         2231   PROFITABLITY

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Processing

Processing

Processing

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      9465649   PRICES

      3548479   PRICING

      1302524   QUANTITY

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       962739   QUANTITIES
      6132989   VOLUME
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VOLUME)


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       781105   SELLER
      2985336   SUPPLIER
      1532776   DISTRIBUTOR
       175379   WHOLESALER
S4        437   S S3 AND (SELLER OR SUPPLIER OR DISTRIBUTOR OR WHOLESALER)


?  s s1 and s4
     79831588   S1
          437   S4
S5         77   S S1 AND S4


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>>>W:  Duplicate detection is not supported for File 348.
Duplicate detection is not supported for File 349.
Duplicate detection is not supported for File 347.
Records from unsupported files will be retained in the RD set.
S6         63   RD  (UNIQUE ITEMS)


?  t s6/free/all
>>>W:  "FREE" is not a valid format name in file(s): 347-349
```

6/8/1 (Item 1 from file: 15)
ABI/Inform(R)

02528567 117543066
USE FORMAT 7 OR 9 FOR FULL TEXT
Keynote paper From marketing mix to relationship marketing - towards a paradigm shift in marketing
Word Count: 13117

1997
Geographic Names: Finland

Descriptors: Relationship marketing; Marketing management; Trends; Changes; Theory; Service industries; Market strategy
Classification Codes: 7000 (CN=Marketing); 9175 (CN=Western Europe)
Print Media ID: 14825

6/8/2 (Item 2 from file: 15)
ABI/Inform(R)

02327584 86066530
USE FORMAT 7 OR 9 FOR FULL TEXT
The supply chain balancing act - stock and service at a profit
Word Count: 1817
1996

Descriptors: Studies; Logistics; Supply chains; Profitability; Inventory management
Classification Codes: 9130 (CN=Experimental/Theoretical); 5330 (CN=Inventory management); 5160 (CN=Transportation)
Print Media ID: 11839

6/8/3 (Item 3 from file: 15)
ABI/Inform(R)

01849983 05-00975
USE FORMAT 7 OR 9 FOR FULL TEXT
On the relationship between DSS design characteristics and ethical decision making
Word Count: 8181 Length: 18 Pages
Summer 1999
Geographic Names: US

Descriptors: Decision support systems; Decision making models; Organizational behavior; Design; Ethics; Studies
Classification Codes: 9190 (CN=United States); 5240 (CN=Software & systems); 9130 (CN=Experimental/Theoretical); 2500 (CN=Organizational behavior)

6/8/4 (Item 4 from file: 15)
ABI/Inform(R)

01722905 03-73895
USE FORMAT 7 OR 9 FOR FULL TEXT
Price customization

Word Count: 3340 Length: 8 Pages
Fall 1998
Geographic Names: US

Descriptors: Marketing mixes; Pricing policies; Customization; Market strategy; Profit maximization; Statistical data
Classification Codes: 9190 (CN=United States); 7000 (CN=Marketing); 9140 (CN=Statistical data)

6/8/5 (Item 5 from file: 15)
ABI/Inform(R)

01704074 03-55064
USE FORMAT 7 OR 9 FOR FULL TEXT
Optimize your supply chain for best-possible operations
Word Count: 2252 Length: 5 Pages
Sep 1998

Descriptors: Optimization; Supply chains; Vendor supplier relations; Software; Linear programming
Classification Codes: 5240 (CN=Software & systems); 2600 (CN=Management science/Operations research); 5330 (CN=Inventory management); 8630 (CN=Lumber & wood products industries)

6/8/6 (Item 6 from file: 15)
ABI/Inform(R)

01691207 03-42197
USE FORMAT 7 OR 9 FOR FULL TEXT
Everyone wants in
Word Count: 14404 Length: 23 Pages
Jul 1998
Company Names:
i2 Technologies
Manugistics Inc
Industri-Matematik Inc
HK Systems
Numetrix Ltd
Geographic Names: US

Descriptors: Supply chains; Software industry; Ratings & rankings; Manycompanies
Classification Codes: 5160 (CN=Transportation); 8302 (CN=Software and computer services); 9190 (CN=United States)

6/8/7 (Item 7 from file: 15)
ABI/Inform(R)

01607662 02-58651
USE FORMAT 7 OR 9 FOR FULL TEXT
Hidden profits...and losses
Word Count: 627 Length: 1 Pages
Mar 15, 1998
Geographic Names: US

Descriptors: Beverage industry; Data warehouses; Information retrieval; Data base management
Classification Codes: 9190 (CN=United States); 8610 (CN=Food processing industry); 5220 (CN=Data processing management)

6/8/8 (Item 8 from file: 15)
ABI/Inform(R)

01448817 00-99804
USE FORMAT 7 OR 9 FOR FULL TEXT
Japan's refiner/marketers continue to grapple with downstream deregulation
Word Count: 3589 Length: 6 Pages
Jul 7, 1997
Geographic Names: Japan

Descriptors: Statistical data; Refineries; Deregulation; Marketing; Petroleum industry
Classification Codes: 8510 (CN=Petroleum industry); 7000 (CN=Marketing); 9140 (CN=Statistical data); 9179 (CN=Asia & the Pacific); 4310 (CN=Regulation)

6/8/9 (Item 9 from file: 15)
ABI/Inform(R)

01433702 00-84689
USE FORMAT 7 OR 9 FOR FULL TEXT
Applying commercial processes to defense acquisition
Word Count: 4409 Length: 10 Pages
1997
Company Names:
Department of Defense
Air Force-US
Geographic Names: US

Descriptors: Military weapons; Government contracts; Flexible manufacturing systems; Government purchasing; Assembly lines; Private sector
Classification Codes: 9190 (CN=United States); 5120 (CN=Purchasing); 5310 (CN=Production planning & control); 9550 (CN=Public sector); 8650 (CN=Electrical & electronics industries)

6/8/10 (Item 10 from file: 15)

ABI/Inform(R)

01403997 00054984
USE FORMAT 7 OR 9 FOR FULL TEXT
Patterns of credible commitments: Territory and brand selectivity in industrial distribution channels
Word Count: 11108 Length: 16 Pages
Apr 1997
Geographic Names: US

Descriptors: Distribution channels; Vendor supplier relations; Studies; Statistical analysis
Classification Codes: 9190 (CN=United States); 9130 (CN=Experimental/Theoretical); 7400 (CN=Distribution)

6/8/11 (Item 11 from file: 15)
ABI/Inform(R)

01400077 00051064
USE FORMAT 7 OR 9 FOR FULL TEXT
Transfer pricing effects on locally measured organizations
Word Count: 6684 Length: 9 Pages
Mar/Apr 1997

Descriptors: Decision making; Management accounting; Transfer pricing; Market prices; Mathematical models; Studies; Statistical analysis
Classification Codes: 9130 (CN=Experimental/Theoretical); 4120 (CN=Accounting policies & procedures)

6/8/12 (Item 12 from file: 15)
ABI/Inform(R)

01181889 98-31284
USE FORMAT 7 OR 9 FOR FULL TEXT
Bad for practice: A critique of the transaction cost theory
Word Count: 14831 Length: 35 Pages
Jan 1996

Descriptors: Studies; Economic theory; Cost analysis; Transactional analysis
Classification Codes: 9130 (CN=Experimental/Theoretical); 3100 (CN=Capital & debt management) ; 1130 (CN=Economic theory)

6/8/13 (Item 13 from file: 15)
ABI/Inform(R)

01142196 97-91590
USE FORMAT 7 OR 9 FOR FULL TEXT
Price discrimination using in-store merchandising

Word Count: 10167 Length: 14 Pages
Jan 1996
Geographic Names: US

Descriptors: Retailing industry; Discount coupons; Price cuts; Effectiveness; Sales promotions; Retail sales; Profit maximization; Studies; Comparative analysis
Classification Codes: 9190 (CN=United States); 9130 (CN=Experimental/Theoretical); 8390 (CN=Retailing industry); 7200 (CN=Advertising)

6/8/14 (Item 14 from file: 15)
ABI/Inform(R)

01068409 97-17803
USE FORMAT 7 OR 9 FOR FULL TEXT
Solving the product/channel puzzle
Word Count: 766 Length: 1 Pages
Jul 1995
Geographic Names: US

Descriptors: Beverage industry; Distribution planning; Niche marketing
Classification Codes: 8610 (CN=Food processing industry); 7400 (CN=Distribution); 9190 (CN=United States)

6/8/15 (Item 15 from file: 15)
ABI/Inform(R)

00870784 95-20176
USE FORMAT 7 OR 9 FOR FULL TEXT
From marketing mix to relationship marketing: Towards a paradigm shift in marketing
Word Count: 12968 Length: 17 Pages
1994

Descriptors: Marketing mixes; Market strategy; Customer relations; Theory; Trends; International
Classification Codes: 9180 (CN=International); 9130 (CN=Experimental/Theoretical); 7000 (CN=Marketing); 2400 (CN=Public relations)

6/8/16 (Item 16 from file: 15)
ABI/Inform(R)

00813072 94-62464
USE FORMAT 7 OR 9 FOR FULL TEXT
Branch networks and alternative distribution channels: Threats and opportunities
Word Count: 4123 Length: 6 Pages
1993
Geographic Names: UK

Descriptors: Financial institutions; Trends; Branch banking; Distribution channels; Customer satisfaction
Classification Codes: 8100 (CN=Financial services industry); 7400 (CN=Distribution); 9175 (CN=Western Europe)

6/8/17 (Item 17 from file: 15)
ABI/Inform(R)

00625475 92-40577
USE FORMAT 7 OR 9 FOR FULL TEXT
Stockout Costs in Distribution Systems for Spare Parts
Word Count: 7872 Length: 12 Pages
1992

Descriptors: Inventory control; Component parts; Automotive repair services; Economic models; Distribution costs
Classification Codes: 8390 (CN=Retailing industry); 5330 (CN=Inventory management); 9130 (CN=Experimental/Theoretical); 5160 (CN=Transportation)

6/8/18 (Item 18 from file: 15)
ABI/Inform(R)

00592253 92-07426
USE FORMAT 7 OR 9 FOR FULL TEXT
Computerized Maintenance Boosts Reliability, Trims Costs
Word Count: 1634 Length: 3 Pages
Jan 1992
Company Names:
Pitchess Honor Rancho
Geographic Names: US

Descriptors: Case studies; Power plants; Maintenance management; Correctional institutions; Advantages; Computers; Cost control
Classification Codes: 9110 (CN=Company specific); 9550 (CN=Public sector); 9190 (CN=United States); 5130 (CN=Maintenance); 5240 (CN=Software & systems)

6/8/19 (Item 1 from file: 9)
Business & Industry(R)

01974720 Supplier Number: 25415690 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Statoil in America

September 1999
Word Count: 1699

Company Names: STATOIL ENERGY INC; STATOIL ENERGY SERVICES INC
Industry Names: Business services; Energy; Oil & gas; Professional management services; Utilities
Product Names: Electric power generation, transmission, or distribution (491000); Gas production and distribution (492000); Management services (874100)
Concept Terms: All company; All market information; Capacity; Corporate strategy; Sales
Geographic Names: North America (NOAX); United States (USA)

6/8/20 (Item 2 from file: 9)
Business & Industry(R)

01093808 Supplier Number: 23678376 (USE FORMAT 7 OR 9 FOR FULLTEXT)
The Great MRP Debate

October 21, 1996
Word Count: 1115
Product Names: National economic data (981000)
Concept Terms: All market information; Inventory; Market size
Geographic Names: North America (NOAX); United States (USA)

6/8/21 (Item 1 from file: 621)
Gale Group New Prod.Annou.(R)

02164813 Supplier Number: 55675013 (USE FORMAT 7 FOR FULLTEXT)
PaperDeals.com Launches with 3,500 Pre-Registered Companies.

Sept 7 , 1999
Word Count: 795
Publisher Name: Business Wire
Company Names: *PaperDeals.com; PrintBid.com
Product Names: *4811522 (Internet Access Providers)
Industry Names: BUS (Business, General); BUSN (Any type of business)
SIC Codes: 4822 (Telegraph & other communications)
NAICS Codes: 51331 (Wired Telecommunications Carriers)

6/8/22 (Item 1 from file: 16)
Gale Group PROMT(R)

05960242 Supplier Number: 53232507 (USE FORMAT 7 FOR FULLTEXT)

Voices of the Leaders.
Nov , 1998
Word Count: 6054

Publisher Name: Howfrey Communications LLC
Event Names: *220 (Strategy & planning)
Geographic Names: *1USA (United States)
Product Names: *5411100 (Supermarkets)
Industry Names: BUSN (Any type of business); FOOD (Food, Beverages and Nutrition); RETL (Retailing)
NAICS Codes: 44511 (Supermarkets and Other Grocery (except Convenience) Stores)
Advertising Codes: 85 Industry Market Data

6/8/23 (Item 2 from file: 16)
Gale Group PROMT(R)

05503877 Supplier Number: 48340103 (USE FORMAT 7 FOR FULLTEXT)

Providing a practical lesson in product instructions
March 6 , 1998
Word Count: 1107
Publisher Name: Miller Freeman UK Ltd.
Company Names: *Userview
Event Names: *220 (Strategy & planning)
Geographic Names: *4EUUK (United Kingdom)
Product Names: *7397063 (Appliance Testing Labs)
Industry Names: BUSN (Any type of business); CNST (Construction and Materials); INTL (Business, International)
NAICS Codes: 54138 (Testing Laboratories)
Special Features: COMPANY
Advertising Codes: 55 Company Planning/Goals

6/8/24 (Item 3 from file: 16)
Gale Group PROMT(R)

01795654 Supplier Number: 42260300 (USE FORMAT 7 FOR FULLTEXT)

Concurrent engineering improves the effectiveness of CAE
August , 1991
Word Count: 2666
Publisher Name: SKC Communication Services Ltd.
Event Names: *230 (Production management)
Geographic Names: *4EUUK (United Kingdom)
Product Names: *3070200 (Molded Plastic Products); 3559350 (Plastics Molding Machines)
Industry Names: BUSN (Any type of business); CHEM (Chemicals, Plastics and Rubber); INTL (Business, International)
NAICS Codes: 326121 (Unsupported Plastics Profile Shape Manufacturing); 33322 (Plastics and Rubber Industry Machinery Manufacturing)

6/8/25 (Item 1 from file: 148)
Gale Group Trade & Industry DB

0019789675 Supplier Number: 78630836 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Electronically Wiring the Network: Efficient Consumer Response (ECR) Electronic Data Interchange (EDI) and Interdependence.

Annual , 1999
Word Count: 3267 Line Count: 00277
Industry Codes/Names: BUSN Business; BUS Business, general; INTL Business, international
Descriptors: Electronic data interchange--Influence; Grocery industry--Management; Business-to-business market--Analysis; Marketing--Methods
Geographic Codes: 1USA United States

6/8/26 (Item 2 from file: 148)
Gale Group Trade & Industry DB

12144882 Supplier Number: 61647441 (USE FORMAT 7 OR 9 FOR FULL TEXT)
How to create your product pricing strategy.

Jan 7 , 2000
Word Count: 957 Line Count: 00073
Industry Codes/Names: BUSN Any type of business; REG Business, Regional
File Segment: TI File 148

6/8/27 (Item 3 from file: 148)
Gale Group Trade & Industry DB

12139353 Supplier Number: 61202114 (USE FORMAT 7 OR 9 FOR FULL TEXT)
An analytical comparison of long and short term contracts.(Statistical Data Included)

August , 1999
Word Count: 10590 Line Count: 00885
Industry Codes/Names: BUSN Any type of business; ENG Engineering and Manufacturing
Descriptors: Production management--Analysis; Industrial efficiency--Analysis; Production planning--Analysis; Outsourcing--Analysis; Manufacturing industry--Production management; Contracts--Interpretation and construction
Geographic Codes: 1USA United States
File Segment: AI File 88

6/8/28 (Item 4 from file: 148)
Gale Group Trade & Industry DB

12139037 Supplier Number: 61030020 (USE FORMAT 7 OR 9 FOR FULL TEXT)

The newsboy problem with multiple demand classes.

May , 1999
Word Count: 9173 Line Count: 00943
Industry Codes/Names: BUSN Any type of business; ENG Engineering and Manufacturing
File Segment: AI File 88

6/8/29 (Item 5 from file: 148)
Gale Group Trade & Industry DB

11787266 Supplier Number: 58538729 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Livingstone Teas From Kenya.

Dec , 1999
Word Count: 1787 Line Count: 00147
Company Names: Equitea USE Eksport Processing Zone Co.
Industry Codes/Names: BUSN Any type of business; FOOD Food, Beverages and Nutrition
Descriptors: Kenya
File Segment: TI File 148

6/8/30 (Item 6 from file: 148)
Gale Group Trade & Industry DB

11768345 Supplier Number: 57815972 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Impacts of Land Development Charges.(Statistical Data Included)

August , 1999
Word Count: 5775 Line Count: 00472
Industry Codes/Names: AGRI Agriculture, Fishing and Tobacco
Descriptors: Real estate development--Taxation; Environmental law--Compliance costs; Urban land use--Environmental aspects; City planning--Environmental aspects ; Environmental policy--Economic aspects
Geographic Codes: 1USA United States
File Segment: MC File 75

6/8/31 (Item 7 from file: 148)
Gale Group Trade & Industry DB

11763764 Supplier Number: 57485725 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Hydrocarbon Processing's Advanced Control and Information Systems '99.(innovations in control hardware and software packages)

Sept , 1999
Word Count: 60179 Line Count: 05469
Industry Codes/Names: BUSN Any type of business; OIL Petroleum, Energy Resources and Mining

File Segment: TI File 148

6/8/32 (Item 8 from file: 148)
Gale Group Trade & Industry DB

11590073 Supplier Number: 55905499 (USE FORMAT 7 OR 9 FOR FULL TEXT)
An interview with Joseph S. Calvaruso.(senior vice president and loan administrator of Shoreline Bank)(Interview)(Cover Story)

March , 1999
Word Count: 3196 Line Count: 00252
Company Names: Shoreline Bank--Officials and employees
Industry Codes/Names: BANK Banking, Finance and Accounting; BUSN Any type of business
Descriptors: Banking industry--Officials and employees; Consumer credit--Management; Loans--Management; Risk management--Technique
Named Persons: Calvaruso, Joseph S.--Interviews
Product/Industry Names: 6010000 (Banking Institutions); 6020130 (Consumer Loans); 9915300 (Asset & Risk Management)
Product/Industry Names: 6000 DEPOSITORY INSTITUTIONS; 6020 Commercial Banks
NAICS Codes: 5221 Depository Credit Intermediation; 52231 Mortgage and Nonmortgage Loan Brokers
File Segment: MC File 75

6/8/33 (Item 9 from file: 148)
Gale Group Trade & Industry DB

10856112 Supplier Number: 54010871 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Computer product update: vendors offer new and updated software and hardware.(software and hardware products for beer industry)

Jan 18 , 1999
Word Count: 2364 Line Count: 00197
Company Names: Micro Vane Inc.--Products; Coaxis Inc. Insight Distribution Systems-- Product introduction; Data Consultants Inc.--Innovations
Industry Codes/Names: BUSN Any type of business; FOOD Food, Beverages and Nutrition
Descriptors: Brewing industry--Computer programs; Computer software industry--Products; Computer industry--Products
Product/Industry Names: 7372416 (Manufacturing, Distribution & Retailing Software); 3573100 (Computers); 2082000 (Beer & Other Malt Beverages)
Product/Industry Names: 7372 Prepackaged software; 3571 Electronic computers; 2082 Malt beverages
NAICS Codes: 51121 Software Publishers; 334111 Electronic Computer Manufacturing; 31212 Breweries
File Segment: TI File 148

6/8/34 (Item 10 from file: 148)
Gale Group Trade & Industry DB

10123905 Supplier Number: 20453971 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Hidden profits ... and losses.(Column)

March 15 , 1998
Word Count: 660 Line Count: 00056
Industry Codes/Names: BUSN Any type of business; FOOD Food, Beverages and Nutrition
Descriptors: Beverage industry--Data processing; Information technology--Usage
Product/Industry Names: 5149000 (Grocery Products NEC Whsle); 2080000 (Beverages)
Product/Industry Names:

5149 Groceries and related products, not elsewhere classified; 2080 Beverages
File Segment: TI File 148

6/8/35 (Item 11 from file: 148)
Gale Group Trade & Industry DB

09647464 Supplier Number: 18259799 (USE FORMAT 7 OR 9 FOR FULL TEXT)
The regulatory treatment of utility diversification. (includes appendix)(Special Issue: Public Utilities Regulation)

August , 1995
Word Count: 8720 Line Count: 00803

Special Features: table; chart; illustration
Industry Codes/Names: BUSN Any type of business; ENV Environment; REAL Real Estate
Descriptors: Public utilities--Laws, regulations, etc.; Diversification in industry-- Management
Product/Industry Names: 4900000 (Electric, Gas & Water Utilities)
Product/Industry Names: 4900 ELECTRIC, GAS, AND SANITARY SERVICES
File Segment: MC File 75

6/8/36 (Item 12 from file: 148)
Gale Group Trade & Industry DB

09067436 Supplier Number: 18820742 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Coupon face value: its impact on coupon redemptions, brand sales, and brand profitability.

Fall , 1996
Word Count: 7402 Line Count: 00597

Special Features: illustration; table; chart
Industry Codes/Names: RETL Retailing; BUSN Any type of business
Descriptors: Coupons (Retail)--Economic aspects; Sales promotions--Economic aspects; Stores--Economic aspects
Product/Industry Names: 5200110 (Retail Stores); 9914350 (Sales Promotion)

File Segment: TI File 148

6/8/37 (Item 13 from file: 148)
Gale Group Trade & Industry DB

08999559 Supplier Number: 18702020 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Frozen food sales still on uptrack in QFF-friendly Denmark and Sweden. (quick frozen foods)(Industry Overview)

July , 1996
Word Count: 10346 Line Count: 00792

Special Features: illustration; photograph
Industry Codes/Names: FOOD Food, Beverages and Nutrition; BUSN Any type of business
Descriptors: Frozen foods industry--Scandinavia; Denmark--Business and industry; Sweden --Business and industry
Product/Industry Names: 2030020 (Frozen Foods)
Product/Industry Names: 2030 Preserved Fruits and Vegetables
File Segment: TI File 148

6/8/38 (Item 14 from file: 148)
Gale Group Trade & Industry DB

08613799 Supplier Number: 18037493 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Identifying opportunities. (executives polled on opportunities to sell personal computers)

Feb 26 , 1996
Word Count: 720 Line Count: 00061

Special Features: illustration; photograph
Industry Codes/Names: HOME Home Furnishings
Descriptors: Microcomputers--Marketing; Computer stores--Marketing; Marketing--Technique
Product/Industry Names: 3573115 (Microcomputers)
Product/Industry Names: 3571 Electronic computers
File Segment: TI File 148

6/8/39 (Item 15 from file: 148)
Gale Group Trade & Industry DB

08160578 Supplier Number: 17485179 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Integrate blending control, optimization and planning. (petroleum refineries)

August , 1995
Word Count: 4799 Line Count: 00416

Special Features: illustration; table; chart
Industry Codes/Names: OIL Petroleum, Energy Resources and Mining
Descriptors: Petroleum refineries--Production management; Management information systems --Planning
Product/Industry Names: 3573021 (Management Informatn Computer Systems); 2910001 (Petroleum Refining)
Product/Industry Names: 3571 Electronic computers; 2911 Petroleum refining
File Segment: TI File 148

6/8/40 (Item 16 from file: 148)
Gale Group Trade & Industry DB

08050803 Supplier Number: 17360032 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Solving the product/channel puzzle. (beverage industry distribution planning)(Total Sales Management)(Column)

July , 1995
Word Count: 773 Line Count: 00068
Industry Codes/Names: FOOD Food, Beverages and Nutrition
Descriptors: Beverage industry--Distribution; Logistics--Planning
Product/Industry Names: 2080000 Beverages
Product/Industry Names: 2080 Beverages
File Segment: TI File 148

6/8/41 (Item 17 from file: 148)
Gale Group Trade & Industry DB

07560119 Supplier Number: 16337664 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Import policy effects on the optimal oil price.

July , 1994
Word Count: 5939 Line Count: 00514

Special Features: illustration; table; graph
Industry Codes/Names: OIL Petroleum, Energy Resources and Mining
Descriptors: Tariffs--Analysis; Petroleum--Prices and rates
File Segment: TI File 148

6/8/42 (Item 18 from file: 148)
Gale Group Trade & Industry DB

07543452 Supplier Number: 16310540 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Trading volume and transaction costs in specialist markets. (includes appendix)

Sept , 1994
Word Count: 6217 Line Count: 00534

Special Features: illustration; graph
Industry Codes/Names: BANK Banking, Finance and Accounting
Descriptors: Financial markets--Research; Securities--Research; Stock-exchange--Research
Product/Industry Names: 6231 Security and commodity exchanges
File Segment: MC File 75

6/8/43 (Item 19 from file: 148)
Gale Group Trade & Industry DB

07494758 Supplier Number: 15669371 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Resale price maintenance as a private contract enforcement mechanism: the special services case.

July , 1994
Word Count: 8670 Line Count: 00718

Special Features: illustration; chart; graph
Industry Codes/Names: REG Business, Regional
Descriptors: Pricing--Research; Motivation research (Marketing)--Reports; Retail industry--Prices and rates
Product/Industry Names: 5200000 (Retail Trade)
File Segment: TI File 148

6/8/44 (Item 20 from file: 148)
Gale Group Trade & Industry DB

06478760 Supplier Number: 13929780 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Monetary rewards and decision cost in experimental economics.

April , 1993
Word Count: 9267 Line Count: 00738

Special Features: illustration; table; graph
Industry Codes/Names: BUS Business, General
Descriptors: Consumer behavior--Research
File Segment: TI File 148

6/8/45 (Item 21 from file: 148)
Gale Group Trade & Industry DB

06220680 Supplier Number: 13906712 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Daring to be different links St. Louis marketer with supplier. (Denise Loeffler)

Oct , 1992
Word Count: 1902 Line Count: 00143

Industry Codes/Names: OIL Petroleum, Energy Resources and Mining
Descriptors: Industrial suppliers--Management
Named Persons: Loeffler, Denise--Marketing
File Segment: TI File 148

6/8/46 (Item 22 from file: 148)
Gale Group Trade & Industry DB

06205166 Supplier Number: 13615098 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Theory of the firm in relation to exchange rates, import substitution and export.

Dec , 1992
Word Count: 6454 Line Count: 00504

Special Features: illustration; table; graph
Industry Codes/Names: BUS Business, General
Descriptors: Foreign exchange--Prices and rates; Import substitution--Economic aspects; Exports--Economic aspects
File Segment: TI File 148

6/8/47 (Item 23 from file: 148)
Gale Group Trade & Industry DB

06169208 Supplier Number: 12813783 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Hydrocarbon Processing's Advanced Process Control Handbook VII. (Cover Story)

Sept , 1992
Word Count: 29334 Line Count: 02689

Special Features: illustration; photograph; chart
Industry Codes/Names: OIL Petroleum, Energy Resources and Mining
Descriptors: Petroleum chemicals industry--Equipment and supplies; Chemical process control--Equipment and supplies; Programmable controllers--Equipment and supplies; Computer-integrated manufacturing--Equipment and supplies
Product/Industry Names: 2910 Petroleum chemicals industry; 3823 Process control instruments
File Segment: TI File 148

6/8/48 (Item 24 from file: 148)
Gale Group Trade & Industry DB

05911319 Supplier Number: 12418287 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Virtual prices and a general theory of the owner operated firm.

April , 1992

Word Count: 7531 Line Count: 00627

Special Features: illustration; graph
Industry Codes/Names: REG Business, Regional
Descriptors: Entrepreneurship--Economic aspects; Businessmen--Economic aspects; Prices--Economic aspects; Profit--Economic aspects
File Segment: TI File 148

6/8/49 (Item 25 from file: 148)
Gale Group Trade & Industry DB

05783226 Supplier Number: 11808792 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Computerized maintenance boosts reliability, trims costs. (power plant at the Pitchess Honor Rancho jail in Saugus, California)

Jan , 1992
Word Count: 1792 Line Count: 00151

Special Features: illustration; photograph; table
Industry Codes/Names: OIL Petroleum, Energy Resources and Mining
Descriptors: Combined-cycle power plants--Maintenance and repair; Plant maintenance-- Automation
Product/Industry Names: 4911 Electric services
File Segment: TI File 148

6/8/50 (Item 26 from file: 148)
Gale Group Trade & Industry DB

04872078 Supplier Number: 09116804 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Solving the inventory problem for the sale of seasonal merchandise.

July , 1990
Word Count: 3423 Line Count: 00271
Industry Codes/Names: BUS Business, General
Descriptors: Mountain Sporting Goods--Logistics; Inventory control--Technique; Seasonal industries--Logistics; Sporting goods industry--Logistics
Product/Industry Names: 3949 Sporting and athletic goods, not elsewhere classified

File Segment: MI File 47

6/8/51 (Item 27 from file: 148)
Gale Group Trade & Industry DB

03323306 Supplier Number: 06122313 (USE FORMAT 7 OR 9 FOR FULL TEXT)

Developing an approach. (includes 3 related articles) (The Making of a Menu)

Nov 20 , 1987
Word Count: 3461 Line Count: 00271

Special Features: illustration; photograph
Company Names: Jack in the Box Div.--Marketing; Lettuce Entertain You Enterprises Inc.-- Marketing
Industry Codes/Names: TRVL Travel and Hospitality
Descriptors: Annie Eatwell's Restaurant and Bakery--Menus and recipes; Restaurant industry--Marketing; Restaurants--Menus and recipes; Chain restaurants-- Menus and recipes
Product/Industry Names: 5812 Eating places
File Segment: TI File 148

6/8/52 (Item 28 from file: 148)
Gale Group Trade & Industry DB

02329106 Supplier Number: 03755941 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Testing merchandising concepts; progressive supermarket operators are using scanning data to explore issues beyond mere inventory replenishment.

May , 1985
Word Count: 2813 Line Count: 00218

Special Features: illustration; photograph; table; chart
Industry Codes/Names: RETL Retailing
Descriptors: supermarkets--Electronic equipment; inventory control--Electronic equipment ; Stores--Electronic equipment; Point-of-sale systems--Usage; Grocery industry--Data processing
Product/Industry Names: 5411 Grocery stores
File Segment: TI File 148

6/8/53 (Item 29 from file: 148)
Gale Group Trade & Industry DB

02323992 Supplier Number: 03628247 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Materials handling - modern challenges and a mature technology. (includes ProMat 85 conference schedule)

Feb , 1985
Word Count: 2251 Line Count: 00186

Special Features: illustration; photograph
Industry Codes/Names: ENG Engineering and Manufacturing; CMPT Computers and Office Automation
Descriptors: Materials Handling Handbook (book)--Publishing; Materials handling equipment industry--Innovations
Product/Industry Names: 3569 General industrial machinery, not elsewhere classified

File Segment: TI File 148

6/8/54 (Item 1 from file: 20)
Dialog Global Reporter

05903601 (USE FORMAT 7 OR 9 FOR FULLTEXT)
The Case Of Centralised Sales

June 25, 1999
Word Count: 4742
Descriptors: Sales; Marketing; Company News; Credit Rating; Restructuring; Strategy ; New Products & Services
Country Names/Codes: India (IN)
Regions: Asia; South Asia

6/8/63 (Item 1 from file: 635)
Business Dateline(R)

0056720 88-14252
No Nonsense Please: Self-Counsel Press Has Built a Reputation for Just-the-Facts-M'am Publishing

Publication Date: 880500
Word Count: 1,939
Dateline: Vancouver, BRC, Canada

Company Names: Self-Counsel Press, Vancouver, BRC, Canada, SIC:Ticker:2731
Classification Codes: 8690 (Publishing industry); 7000 (Marketing)
Descriptors: Publishing industry; Market segments; Corporate histories; Product lines; Publications; Corporate profiles
Named Persons: Douglas, Diana; Touchie, Pat
Special Feature: Photo

>>>W: "FREE" is not a valid format name in file(s): 347-349

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Business Dateline(R)
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Named Persons: Douglas, Diana; Touchie, Pat
Special Feature: Photo

? t s6/k/54

6/K/54 (Item 1 from file: 20)
Dialog Global Reporter

(USE FORMAT 7 OR 9 FOR FULLTEXT)

...the transfer of knowledge across business units? And does it leverage a company's resources optimally? I think our profit-centre-CSO structure stands these tests.''

''I am in favour of a CSO.'' intoned Mullick...arrive at a relevant sales structure.

The market in which Pluto operates seems fairly commoditised. Price, I guess, is the main basis for competition. Any company operating in this context needs...

...the cost of manufacturing can be driven down, thereby enabling the company to compete on price. And how the company can offer customised products and services to large customers. The answers...

...include standard products sold in large numbers through a wide distribution network.

In this low-price, high-volumes business model, the profits will come from reduced manufacturing-costs. While the marketing...20 per cent growth it seeks. I believe Pluto should begin by establishing a dedicated distributor network, which can supplement its non-exclusive dealer network.

Pluto's decision to move towards...organisation in different directions, wrangling regularly over who has the ultimate authority on issues like pricing, stocking, handling customer complaints, offering volume discounts, holding inventory, and collecting receivables from customers.

The profit-centres the company wishes to...

...on manufacturing-related operations alone. They should sell their products at a pre-determined transfer-price to the SMO, which will handle both marketing and sales. The SMO will be accountable...

19990625

? t s6/k/45

6/K/45 (Item 21 from file: 148)
Gale Group Trade & Industry DB

Daring to be different links St. Louis marketer with supplier. (Denise Loeffler)

Abstract: ...pursuing a $1.2 million retail expansion program with able support being provided by her supplier, Houston, TX-based Coastal Corp. Loeffler, a former Phillipsand Fina-branded marketer, has transferred to...

...program, she feels insulated from failure because of the support she's received from her supplier, Houston-based Coastal Corp.
A former Phillips and Fina-branded marketer, Loeffler switched to Coastal...

...instance, at her new location just outside downtown St. Louis, Loeffler will not post gasoline prices on exterior signage. If customers want to know the price, she figures, they'll come into the store. She says it's a low-risk...on her investments. She figures it might take three to five years to realize an optimum profit stream.
"I used to have the ROI figured out to the dollar, but that timetable ...

...truck drivers want more than diesel and are willing to pay for it.
Louisville Street Prices Take Plunge
The grand opening in mid-August of a new combination gasoline/C-store ...

...opening of the new Thornton station, sources say independent firms are trying desperately to keep prices from dipping below 90|cents
/gal.
From the first week of August to the second, prices dropped about 10|cents
/gal. on unleaded regular. Thornton, based in Louisville and operating about...

...celebrated the opening of its newest Louisville facility by selling at 95|cents
/gal. The price was instantly matched by SuperAmerica. Playing a game of oneupsmanship, Thornton dragged the price down to 91|cents
a day or two later. SuperAmerica proceeded to match it, say...

...One source says that in the past, SuperAmerica was one of the leaders in cutting prices, but over the past year or so the division of Ashland, Inc., Ashland, Ky., has...

...itself more of a follower.
"SuperAmerica isn't the culprit anymore for these low street prices," says the source. "Ashland isn't satisfied with the profit return on some of its stations, so it is going more for profit than volume."

Meanwhile, the Lexington, Ky., market is the antithesis of Louisville. One marketer described Lexington as "stable." There haven't been any severe street price fluctuations to speak of, and better margins are reflected in that.

19921000

? t s6/k/27

6/K/27 (Item 3 from file: 148)
Gale Group Trade & Industry DB

...between the flexibility offered by short term contracts and the fixed investments, improvement opportunities and price certainty associated with long term contracts. We show that long term contracts may not always...

...despite extensive amounts of data collected from suppliers on various technical and financial factors, most supplier selection procedures are fairly subjective, with purchase price being the most significant factor. We were especially intrigued by the mismatch between intentions and...

...economies of scale in production, elimination of expenses associated with frequent rebidding for contracts, early supplier involvement leading to faster product development, and mutual cooperation in order fulfillment. Therefore, long term contracts can lead to reduction in purchase prices and improvement in delivery lead time performance, over time, as a consequence of mutual efforts by the firm and the supplier. Also, typically, long term contracts allow risk averse decision makers to hedge against price uncertainty for components by specifying a fixed price for the duration of the contract. The cost to the firm for entering into such...
...include the effort and cost of performing a detailed technical and financial audit of the supplier, technical and financial support, investment in idiosyncratic equipment, and in some instances, acquisition of a share in the supplier's equity. On the other hand, short term contracts usually require firms to pay the market price for components. Thus, they offer a speculative advantage as well as the flexibility to switch to other suppliers. Thus, the elimination of price uncertainty and the benefit of learning associated with long term relationships is traded off against...

...practices we noted in our survey. Details of the analysis and key policy implications for supplier management policy are presented in this paper.

The rest of the paper is organized as...

...using a variety of organizational structures. For example, Shapiro (4) has classified models of buyer-supplier relationships into the adversarial (short term relationships) and the partnership (long term relationships) models. A...has focussed on explaining the forms of governance that emerge between companies engaged in buyer/supplier interactions (9-11). It is based on the notion that such structures emerge so as...

...the flow of materials in a supply chain. Eppen and Iyer (14) analyze a similar quantity flexibility contract for a catalog company. Bassok and Anupindi (15) evaluate contracts with restrictions on minimum purchase quantities. Pasternack (16) and Donohue (17) study buyback contracts. A recent review of this field is...

...discussed in the papers described here focus only on the flexibility with respect to the quantities purchased from the suppliers and do not explicitly model the costs and benefits of the...

...is consistent with observed industry practices with respect to the order of steps involved in supplier selection procedures (2). Also, we assume that the product design is fixed and that as...

...made after contracts have been selected for the year, and involve inventory control and order quantity decisions. These decisions are made over a shorter time frame (e.g., weekly) to support...

...not be revisited. Essentially, we are comparing the two extremes in the continuum of buyer-supplier relationships - short term contracts and long term contracts or partnerships. Further, for convenience, we have...

...and only one of each type is available.

When short term contracts are chosen, market prices (which are random) are paid for components. The market price is revealed at the beginning of each strategic review period, after the contract selection decision...

...stays constant for the rest of that period. The probabilistic mechanism that generates the market prices is described later. On the other hand, long term contracts provide the benefit of a fixed price schedule, which does not fluctuate with market prices over time. We assume that when the contract is first chosen, the price is set through some procedure that may depend upon the uncertainty of the market price throughout that strategic review period (i.e., a function of the probability distribution of market prices). This function is specified in the contract. Thereafter, the price changes only by the amount of annual improvement (also specified in the contract). Thus, a risk averse decision maker might prefer the certain initial value and improvement schedule for prices under the long term contract.

Similarly, the delivery lead times for orders of components are... suppliers, and could be due to reduced delivery lead times, lower

production costs at the supplier, or other process improvements. In this model, we do not specify what fraction of improvements...

...fixed contract specific investments, replenishment lead time, and the schedule for improvements in the purchase price and total annual costs. The managerial problem is to determine the optimal contract for the ...
...chosen in period t, (0: short term, 1: long term);
(p.sub.t) = random market price, with (p.sub.t) denoting a price realization, in period t;
(f.sub.t)(.) = probability density function of the market price (p.sub.t);
(p.sub.t)((y.sub.t),(f.sub.t) = unit price paid under contract (y.sub.t) (a function of (f.sub.t);
(micro) = mean demand...

...is a constant which measures the manager's risk aversion to uncertainties due to purchase price fluctuations. The mean-variance approach has been used extensively in financial theory, and has been...

...t)((y.sub.t));
(P.sub.t)((y.sub.t),(f.sub.t)) = total purchase price paid during period t;
(C.sub.t)((y.sub.t),(f.sub.t)) = optimal inventory...

...cost from period t to the end of the planning horizon given the contract and price realization in period t - 1.

The model is formulated as a stochastic dynamic program. It incorporates uncertainty in both component prices and demand. At the beginning of each strategic review period t, the state space for the firm is specified by the contract used and component price realization in the previous period. The manager then chooses the contract for the present period...

...are discussed next.

3.4. Expected purchasing costs

First, we state our assumptions about how prices for components are realized in the market. Next, we will state our assumptions about how prices are set under each contract type.

In the most general formulation of the problem, the component prices may be nonstationary across time periods. We will discuss the general case in terms of a special instance of price dynamics: the multiplicative Binomial price process. The distribution of the price ((f.sub.t)) is assumed to depend upon the

price
realization in the previous period as:
(p.sub.t) = {((p.sup.u).sub.t) = (p...

...u) and ((delta).sub.d) are constants that denote the upward and downward movements in prices respectively. In this model, which is similar to a random walk model, price realizations in successive periods are

correlated. It is representative of a market environment that is non-stationary and evolving (evolutionary) with respect to the prices. The model is a discrete approximation of stochastic models that are traditionally used to represent price processes (28,29).

Under this model of price process, we assume that for short term contracts, (p.sub.t)((y.sub.t),(f.sub.t)) = (p.sub.t), the random market price. On the other hand, for long term contracts, in the strategic review period the contract is first selected, the purchase price is a function (defined in the contract) of the distribution of the random market price. Thereafter, it is independent of the realizations of the market price, but decreases according to the pre-specified schedule of improvement in the contract. For example...

...paper, we have assumed that when the long term contract is first selected, the purchase price is equal to the expected market price during that period, i.e.,

(p.sub.t)((y.sub.t),(f.sub.t)) = ((pi...

...may be determined by a different function that reflects the impact of uncertainty on the supplier's profitability (e.g., the supplier may pick price as a fractile of the distribution if he was risk averse). Since we do not focus on the supplier's operations here, this pricing function is assumed to be exogenous to our model. Clearly, under a long term contract...

...also a function of (delta) (the improvement rate).

Using this notation, the total expected purchase price during the entire strategic review period,

(P.sub.t)((y.sub.t),(f.sub.t...

...the holding cost rate per unit per tactical review period by h (= r% of purchase price) and the shortage cost by b.

(C.sub.t)((y.sub.t),(f.sub.t...

...for orders of finished products). Recall that the second source of uncertainty is the purchase price, which is revealed at the beginning of the strategic review period, after contract selection, but...

...model, inventory is held strictly to meet demand and hedge against demand uncertainty, not for price speculation.

For a given contract and purchase price, the optimal inventory stocking policy and the resulting inventory and shortage cost can be determined...

...denote the cumulative probability and probability density for a standard normal function. For a given price realization and contract in period t, using standard results from the inventory theory literature, the ...

...solution to the Contract Selection Problem.

As noted earlier, under the assumption of the Binomial price process, component prices are correlated across time periods, and the price of long term contracts depends upon the uncertain market

prices. As a result of such non-stationarities, the solution can only be determined numerically. (Readers...

...b is $10 per unit per week. Before the beginning of period 1, the market

price is assumed to be $50. The distribution of the market price is assumed to be as follows:

(p.sub.t+1) = {((p.sup.u).sub.t...

...0.5 (p.sub.t) w.p. ((pi).sup.d) = 0.5.

The two market price realizations are chosen to model a highly volatile market. The effect of changing this degree...weeks and 0. We assume that when a long term contract is first selected, the price is equal to the mean of the market price in that period. Thereafter, price reduces by a factor of (delta) every year.

Table 1 compares the disutility of costs...

...optimal strategy is to invest in the long term contract immediately. The benefit due to price certainty and improvement rate of the long term contract outweigh any possible speculative benefit of...

...long term contract. When K = $60 000, the optimal solution is contingent on the market price realization. The optimal strategy is to enter into a short term contract at the beginning of the first period. If the higher market price is realized in that period, a long term contract is selected at the beginning of the second period. However, if the lower price is realized, it is best to continue with short term contracts. Intuitively, the expected market price in the future periods is higher if the higher price is realized in the first period (i.e., Equation 3 induces a positive corr elation between prices in successive time periods). Consequently, when that happens, in this example, the benefit of protection from future upside risk that is possible by locking in a fixed price through a long term contract at the beginning of the second period outweighs its fixed...

...the long term contract is selected in the very first time period, there is no price related uncertainty in the total cost since the firm locks in a fixed price for the entire horizon (recall that uncertainty in demand in tactical review periods still exists...

...used throughout, there is considerable variability in the costs due to the randomness in purchase price (in addition to the uncertainty in demand). The optimal strategy, however, eliminates a considerable amount...

...the long term contract is selected at the beginning of the second period if the price increases in the first, thereby locking in a fixed price for the rest of the horizon. Therefore, the distribution of cost in the optimal solution...

...choosing a long term contract, while a firm protects itself against any risk associated with price increases in the market, it is unable to take advantage of potential savings resulting from price reductions in the market. Therefore, for a given sourcing strategy Y and a given target...

...be optimal to delay the decision to switch to the long term contract until more price realizations have been observed. Thus, a "wait-and-see" strategy may be best suited. Therefore, forecasts of market conditions, i.e., the distribution of market prices over the planning horizon, must be an important input to the supply management decision.

Another way to characterize price in ...delta).sup.d) = 2. Then, it can be shown that an upward drift in market prices exists only when ((pi).sup.u) (greater than) 0.5. Intuitively, in this case, we...

...long term contracts would be preferred if an upward drift exists so that a fixed price can be locked in. However, it is important to realize that the total cost also...

...30 000, a long term contract may be selected even when a downward drift in price exists. On the other hand, in the other two cases, the long term contract may not be selected even when an upward drift in price exists. Recall that the unit price under the long term contract will be higher when the value of ((pi).sup.u) is higher since the expected market price is higher. Thus, extensive reliance on current contract prices will lead to sub-optimal decisions.

Such observations imply that the tradeoff between fixed investment...

...contract. This tradeoff is explored further in Section 5.

4.2. A special case -- Bernoulli price process

A special case of the above price process results when the prices in successive time periods are independent, i.e.,

(p.sub.t) = {((p.sup.u).sub...

...sup.d) w.p. ((pi).sup.d).

We refer to this assumption as the Bernoulli price process. It can be used to model the situation where (p.sup.u) and (p...

...worst case outcomes in a market environment that is stable (stationary) with respect to the prices of components (which may be a result of a mature technology). Managers often develop such scenarios to conduct analysis of various policies.

This simplified price structure allows the optimal solution to be characterized analytically. In this case, only one decision...

...t) = 0). Superscripts u and d will be used to denote the cases when market prices are high (up) and low (down) respectively. Define

u((V.sup.S)((t.sub.1...

...z.sup.*))), and, (5)

(MATHEMATICAL EXPRESSION NOT REPRODUCIBEL IN ASCII) (6)

where p is the price under a long term contract when it is

first selected. Since there is no purchase price uncertainty under a long term contract, u((PC.sup.L)) = (PC.sup.L). Equations (1...never. This form of the optimal solution results because the state space for the market prices is stationary and independent across time. Intuitively, if it is not optimal to select a...

...able to make sourcing decisions for products that are stable and mature with respect to prices and technology (e.g., certain minerals, or simple integrated circuit chips). However, often, they hesitate...

...for other products whose markets are in an evolutionary state with respect to technology and prices.

5. Comparative statics and policy implications

In this section, we will discuss some policy implications resulting from an extensive numerical sensitivity analysis of our model (under the Binomial price process assumption). Example 2 discussed in the previous section will be used to illustrate our findings. Since the problem structure is greatly simplified under the assumption of the Bernoulli price process, we will state the corresponding results analytically for this special case. (Proofs of these...

...term contract is the improvement in total costs due to cooperation between the buyer and supplier, and supplier learning.

However, it is interesting to note that the improvement rate must be above a...

...investment, the decision maker's risk preference as well as the uncertainty in the market price.

Figure 3 shows the tradeoff between the improvement rate and the fixed investment for our...

...optimal policy is to delay selecting the long term contract until after observing the market prices. The threshold value of (delta), beyond which the long term contract is selected immediately, increases...

...term contracts even if the improvement rate is small, so that they can

hedge against price uncertainty.

In a similar manner, we can also show that the threshold value of improvement...

...savings can be realized in future time periods.

For the special case of the Bernoulli price process, these results can be stated analytically as follows:

Lemma 1. There exists a threshold...

...one of the reasons for selecting long term contracts is the ability to hedge against price uncertainties. Therefore, the perceived value of fixed price long term contracts is higher when the decision maker is more risk averse. However, ...term contracts may not be selected immediately - instead, it may be better to wait until prices increase in the market.

Similarly, if the fixed investment required for the long term

contract...

...6). This issue is examined in more detail next.

For the special case of Bernoulli price process assumption, the above discussion can be stated analytically using the results of Lemma 1...

...delta).sup.2)((lambda).sup.*)/(delta)(K.sup.2) = 0.

5.3. Impact of market price uncertainty

The impact of market price uncertainty on sourcing decisions is not very obvious. Market price uncertainty depends upon the values of the market price realizations, the corresponding probabilities, and the price spread. For example, all else being equal, if the value of ((pi).sup.d) (the probability that market price is low) is too low or too high, the risk (due to variance of purchase price) associated with short term contracts is small. However, as the value of ((pi).sup.d...

...of short term contracts increases since there is a greater chance of a lower market price. At the same time, as ((pi).sup.d) increases, the average market price decreases, which lowers the price under the long-term contract in our model. This nonlinear tradeoff between the risk and...

...increase as ((pi).sup.d) increases. The effect of changes in the value of market price realizations in any period is determined by a similar tradeoff.

Obviously, sourcing decisions are also affected by the way in which price uncertainty evolves over time. When prices are stationary, as in the special case of the Bernoulli price process, sourcing decisions can be finalized for the entire planning horizon at the beginning. However, when prices are non-stationary, sourcing decisions can change over time, and are price dependent.

The above results results can be summarized as follows for the Bernoulli price process assumption:

Lemma 3. There exists a range for ((pi).sup.d), ((pi),(pi)), where...

...d) are obtained from equation 6.

Further, if (p.sup.d*) is the lower market price at which the costs of long and short term contracts are equal, then

(delta)(p...decision maker's risk aversion is sufficiently high (Fig. 5), or the probability of market prices being low is sufficiently low (Fig. 7). Thus, managers must not make contract selection decisions...

...front fixed expenses.

These results have already been summarized analytically for the Bernoulli assumption of price process in Lemmas 1, 2 and 3.

5.5. Impact of length of planning horizon...

...sup.*).sub.M), the minimum length of time needed to recover the fixed investments through

supplier learning, short term contracts should
be preferred. In our example, ((T.sup.*).sub.M) = 5...

...aversion decreases. The following lemma summarizes this result for the special case of the Bernoulli price process.

Lemma 5. There exists a minimum length of planning horizon, ((T.sup.*).sub.M...

...planning horizon, improvement rates for contracts, the decision makers' risk preference, and uncertainty in market prices.

Thus, even if cost improvements result when a long term contract is used, these benefits...

...used. If the decision maker is not very risk averse, the benefit of hedging against price uncertainty (by selecting a long term contract) may be minimal. Similarly, if decisions are made...
...tradeoffs.

Another key factor that affects the choice of sourcing arrangements is the nature of price dynamics for components. In non-stationary markets, sourcing decisions are contingent on the market price realization and firms may be better off by delaying investments in long term contracts. On...to be high. Finally, managers often perceive a great degree of uncertainty in co mponent prices (especially in high-technology industries). Following our model's analysis, it is clear that these...

...choices, then our methodology can be used to adopt a total cost-based approach to supplier selection.

Interestingly, some companies are able to obtain the best of both worlds by selecting long term contracts with suppliers who are expected to match the least price that is prevalant in the markets, but are not allowed to pass on cost increases...

...2). Thus, firms are able to pass on all of the risk associated with component price volatility to their suppliers. This suggests that the negotiation power of the buyers is high...

...model could include multiple sourcing of components, in which case, strategies for allocation of purchase volume to different suppliers must also be derived. Second, since the nature of a product's life cycle is an important source of uncertainty in its demand, sensitivity of the supplier selection and order allocation decisions to the nature and stage of a product's life...

...closed form expressions, they can be studied analytically using a continuous time approximation of the prices in the form of a Brownian motion (30). We believe that special cases of our...

...insights analytically. Finally, we have not made any reference to the factors that affect the supplier's decisions to offer various contract terms. A game theoretic framework that simultaneously considers both the supplier's and the buyer's decisions would be useful.

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The authors are grateful to...Irwin, Homewood, IL.
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An analytical comparison of long and short term contracts.(Statistical Data Included)

COHEN, MORRIS A.; AGRAWAL, NARENDRA
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Text:

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In this paper, we describe an analytical model to determine contracting policies for a firm that purchases components from external suppliers. The model evaluates the tradeoff between the flexibility offered by short term contracts and the fixed investments, improvement opportunities and price certainty associated with long term contracts. We show that long term contracts may not always be optimal, and discuss conditions under which short term contracts may be justified. During a recent survey of supply managers, we observed that managers often tend to participate in short term contracts, even though they claim to seek long term relationships with suppliers. Sensitivity analysis of our model provides some explanation for this observed inconsistency. We also discuss managerial implications of the analysis.

1. Introduction

In today's fast changing and highly competitive market environment, companies in most industries are turning to their suppliers to seek competitive advantage (1). In the manufacturing sector, suppliers are responsible for 43-70% of the cost of goods sold (2) and about 54% of the total value of factory shipments (3). It is no wonder that many firms have begun the process of re-examining their supply management strategies to improve their financial performance and customer delivery service. In this context, strategies that are often discussed include cooperative and longer term relationships with suppliers, reduction in the size of the supply base, and objective qualification and certification of suppliers.

However, in our recent survey of supply managers from a cross-section of process, electronics/computers, and machinery industries (2), we observed that managers have been slow to invest in long term and cooperative relationships with suppliers, even though they claim to seek such relationships. Further, despite extensive amounts of data collected from suppliers on various technical and financial factors, most supplier selection procedures are fairly subjective, with purchase price being the most significant factor. We were especially intrigued by the mismatch between intentions and policies adopted by managers. Our observations also seem to be inconsistent with the trends that have been projected in the business press.

One hypothesis to explain such inconsistency is the lack of an effective methodology to measure the impact of supply strategy alternatives on the financial and operating performance of firms. Consequently, managers find it difficult to effectively compare the total costs and benefits of long and short term relationships, and hence they resort to sub-optimal contract selection. Another hypothesis is that selection of short term contracts is, in fact, optimal in a wide range of situations.

In order to explore these hypotheses, we developed an analytical

model of a manufacturing company, operating in an environment of demand uncertainty, that purchases components from external suppliers. The model is used to compare the effect of sourcing strategy alternatives for components on the total cost (purchasing, inventory and shortage costs) incurred by the firm over the length of its entire planning horizon. In particular, we evaluate the cost and benefits of short term and long term contracts for input components.

Long term relationships with a small number of suppliers have a number of advantages. It can facilitate easier and more frequent communication and information exchange, more effective monitoring of production processes, economies of scale in production, elimination of expenses associated with frequent rebidding for contracts, early supplier involvement leading to faster product development, and mutual cooperation in order fulfillment. Therefore, long term contracts can lead to reduction in purchase prices and improvement in delivery lead time performance, over time, as a consequence of mutual efforts by the firm and the supplier. Also, typically, long term contracts allow risk averse decision makers to hedge against price uncertainty for components by specifying a fixed price for the duration of the contract. The cost to the firm for entering into such contracts includes a fixed investment at the beginning of the relationship. This investment may include the effort and cost of performing a detailed technical and financial audit of the supplier, technical and financial support, investment in idiosyncratic equipment, and in some instances, acquisition of a share in the supplier's equity. On the other hand, short term contracts usually require firms to pay the market price for components. Thus, they offer a speculative advantage as well as the flexibility to switch to other suppliers. Thus, the elimination of price uncertainty and the benefit of learning associated with long term relationships is traded off against the flexibility and near-zero fixed investments associated with short term relationships.

Our model quantifies these tradeoffs. We show that long term contracts may not always be optimal and develop conditions under which short term contracts will be preferred. Our analysis thus provides some explanation for the inconsistencies in supply management practices we noted in our survey. Details of the analysis and key policy implications for supplier management policy are presented in this paper.

The rest of the paper is organized as follows: Section 2 contains a brief review of some of the relevant literature. Section 3 contains the assumptions, notation and formulation of our problem. Analysis of the problem is performed in Section 4. Section 5 discusses the sensitivity and managerial implications of our problem's analysis. In particular, it explores the factors that affect the choice between short and long term contracts. We conclude with a discussion of our approach, and some possible extensions to our research in Section 6.

2. Literature review

Companies in various industries have been observed to interact with their suppliers using a variety of organizational structures. For example, Shapiro (4) has classified models of buyer-supplier relationships into the adversarial (short term relationships) and the partnership (long term relationships) models. A similar classification has been made in Helper (5) in terms of Voice (partnership) and Exit (short term)

relationships. These relationships are characterized by the level of commitment and information exchange between the buyer and suppliers. McMillan (6), Helper (5) and Helper and Sako (7) have reported a slow but cautious move by US manufacturing firms towards the Voice relationship with their suppliers, and an overall trend toward convergence between US and Japanese practices (8).

In contrast to this descriptive literature, the literature on Transactions Costs Analysis has focussed on explaining the forms of governance that emerge between companies engaged in buyer/supplier interactions (9-11). It is based on the notion that such structures emerge so as to minimize the total cost of acquisition, which include production costs as well as the transactions costs associated with establishing and administering ongoing business relationships. As a result of such costs and constraints, a continuum of governance structures can exist, with vertical integration on one extreme, and spot market mediated contracts on the other. This literature suggests that a concern for the future often provides incentives for cooperative behavior and long term relationships by escaping the prisoner's dilemma associated with a short term planning horizon. Other reasons for long term relationships include specific investments, presence of strategic technological capabilities with the vendor, and possibility of lea rning and economies of scale.

There is also an emerging literature in operations management on supply contract evaluation and design. Tsay and Lovejoy (12) and Bassok and Anupindi (13) are representative and consider contracts that provide flexibility in the flow of materials in a supply chain. Eppen and Iyer (14) analyze a similar quantity flexibility contract for a catalog company. Bassok and Anupindi (15) evaluate contracts with restrictions on minimum purchase quantities. Pasternack (16) and Donohue (17) study buyback contracts. A recent review of this field is presented in Tsay et al. (18). However, the contracts discussed in the papers described here focus only on the flexibility with respect to the quantities purchased from the suppliers and do not explicitly model the costs and benefits of the length of the contracts. In contrast, we consider the flexibility that arises due to the length of the selected contract. Finally, for a review of literature on control of the supply process and material and production control activities fo r production systems, we refer the interested reader to Agrawal and Cohen (19), Nahmias and Smith (20), Hausman et al. (21), Ernst and Pyke (22), and Gerchak and Henig (23).

3. The model

3.1. Model assumptions

For the purpose of this paper, we assume that a process of vendor certification has already taken place, and thus the firm has available to it a pool of contracts from which it must choose its sources of supply. This assumption is consistent with observed industry practices with respect to the order of steps involved in supplier selection procedures (2). Also, we assume that the product design is fixed and that as a consequence all make-or-buy decisions have been made. The supply management decisions to be made by the firm are either strategic or tactical. Strategic decisions involve selection of contracts for the components used by the firm for the production of its finished goods, and are made for and reviewed over a longer period of time, typically once a year. Tactical

decisions are made after contracts have been selected for the year, and involve inventory control and order

quantity decisions. These
decisions are made over a shorter time frame (e.g., weekly) to support production of the firm's outputs an d are affected by factors such as the delivery lead time performance of suppliers, demand uncertainty, holding and shortage costs, etc. In turn, they affect the total inventory and shortage costs incurred by the firm.

We assume that the review period for the strategic decisions is long enough to enable steady state analysis of the inventory and production processes. The planning horizon for the problem is (T.sub.M) strategic review periods. Reasonable values for (T.sub.M) are 3-5 years. Each strategic review period consists of (T.sub.T) tactical review periods (e.g., each tactical review period is 1 week long and there are 52 of them in a 1-year strategic review period).

Demand for any component occurs in every tactical review period according to a random, stationary process. We assume that the firm uses a single source of supply for each component. There are two types of contracts to choose from - a short term contract which is one strategic review period long and a long term contract, which is longer than the length of the planning horizon. Thus, long term contracts, once selected, last for the remainder of the planning horizon and the decision to source that component need not be revisited. Essentially, we are comparing the two extremes in the continuum of buyer-supplier relationships - short term contracts and long term contracts or partnerships. Further, for convenience, we have assumed that all dominated contracts have been removed from the consideration set, and only one of each type is available.

When short term contracts are chosen, market prices (which are random) are paid for components. The market price is revealed at the beginning of each strategic review period, after the contract selection decision has been made, and stays constant for the rest of that period. The probabilistic mechanism that generates the market prices is described later. On the other hand, long term contracts provide the benefit of a fixed price schedule, which does not fluctuate with market prices over time. We assume that when the contract is first chosen, the price is set through some procedure that may depend upon the uncertainty of the market price throughout that strategic review period (i.e., a function of the probability distribution of market

prices). This function is specified in the contract. Thereafter, the price changes only by the amount of annual improvement (also specified in the contract). Thus, a risk averse decision maker might prefer the certain initial value and improvement schedule for prices under the long term contract.

Similarly, the delivery lead times for orders of components are also assumed to be specified in the contracts in terms of the number of tactical review periods. Lead times are assumed to decrease when long term contracts are used because of improved delivery performance.

Let (delta) be the specified annual percentage improvement to the

total cost (purchase, inventory and shortage costs) when a long term contract is selected. This improvement is the result of cooperative efforts between buyers and suppliers, and could be due to reduced delivery lead times, lower production costs at the supplier, or other process improvements. In this model, we do not specify what fraction of improvements results from each such effort, but assume a net improvement, 3. No such improvement takes place under short term contracts (i.e., 3 = 0 for short term contracts). Finally, we assume that a fixed investment is incurred when a long term contract is selected. Short term contracts do not entail such an expense.

Thus, in our formulation, a contract for any component is assumed to specify the contract type (long or short), fixed contract specific investments, replenishment lead time, and the schedule for improvements in the purchase price and total annual costs. The managerial problem is to determine the optimal contract for the component for each strategic review period during the entire planning horizon and the corresponding optimal inventory control policies.

3.2. Model notation

Unless noted otherwise, t denotes a strategic review period.

(y.sub.t) = 0--1 decision variable denoting the contract chosen in period t, (0: short term, 1: long term);

(p.sub.t) = random market price, with (p.sub.t) denoting a price realization, in period t;

(f.sub.t)(.) = probability density function of the market price (p.sub.t);

(p.sub.t)((y.sub.t),(f.sub.t) = unit price paid under contract (y.sub.t) (a function of (f.sub.t);

(micro) = mean demand for the component during each tactical review period;

(sigma) = standard deviation of demand for the component during each tactical review period;

L((y.sub.t)) = lead time under contract (y.sub.t).

3.3. Model formulation

The objective of the risk averse manager is to select the contracts that minimize the total disutility of costs over the entire planning horizon. These costs include purchase costs, fixed expenses (contract switching costs), inventory, and shortage costs. We assume that the decision maker uses the following "mean-variance" type of function to evaluate any cost (C) incurred in a strategic review period.

(micro)(C) = E(C) + (lambda) Var(C), (1)

where (lambda) (greater than or equal to) is a constant which measures the manager's risk aversion to uncertainties due to purchase price fluctuations. The mean-variance approach has been used extensively in financial theory, and has been applied to the classic portfolio selection problem (24) and stochastic programming models (25-27).

The following variables are defined to specify the total costs incurred:

K((y.sub.t)) = fixed investment for contract (Y.sub.t) (0 for short term contracts);

(K.sub.t)((y.sub.t-1),(y.sub.t)) = total contract switching costs incurred at the beginning period t
=((y.sub.t)-(y.sub.t-1))(K.sub.t)((y.sub.t));

(P.sub.t)((y.sub.t),(f.sub.t)) = total purchase price paid during period t;

(C.sub.t)((y.sub.t),(f.sub.t)) = optimal inventory and shortage costs incurred during period t;

u((v.sub.t)((y.sub.t-1),((P.sub.t-1))) = total discounted disutility of cost from period t to the end of the planning horizon given the contract and price realization in period t - 1.

The model is formulated as a stochastic dynamic program. It incorporates uncertainty in both component prices and demand. At the beginning of each strategic review period t, the state space for the firm is specified by the contract used and component price realization in the previous period. The manager then chooses the contract for the present period, Yt, and determines optimal inventory control policies for the tactical periods within the strategic review period.

For t = 1,...,(T.sub.M), the overall problem is formulated as the following dynamic program:

U((V.sub.t)((y.sub.t-1),(p.sub.t-1))) = (min.sub.yt){u((K.sub.t)((y.sub.t-1),(y.sub.t))+(P.sub.t)((y.sub.t),(f.sub.t)) +(c.sub.t)((y.sub.t),(f.sub.t))) + (zeta) u((v.sub.t+1)((y.sub.t),(p.sub.t)))}. (2)

Here, (zeta) is the discount factor, defined in terms of the firm's long term cost of capital, r, as (zeta) = 1/(1 + r). Our objective is to select the supply contracts that minimize total disutility of costs incurred over the entire planning horizon, i.e., u((v.sub.1)((y.sub.0),(p.sub.0))), where (y.sub.0) and (p.sub.0) denote the starting conditions, and u((v.sub.(T.sub.M))+1 ((y.sub.(T.sub.M)),(p.sub.(T.sub.M)))) = 0. Expressions for purchase cost and inventory costs are discussed next.

3.4. Expected purchasing costs

First, we state our assumptions about how prices for components are realized in the market. Next, we will state our assumptions about how prices are set under each contract type.

In the most general formulation of the problem, the component prices may be nonstationary across time periods. We will discuss the general case in terms of a special instance of price dynamics: the multiplicative Binomial price process. The distribution of the price ((f.sub.t)) is assumed to depend upon the price realization in the previous period as:

(p.sub.t) = {((p.sup.u).sub.t) = (p.sub.t-1) ((delta).sup.u) w.p. ((pi).sup.u),

((p.sup.d).sub.t) = (p.sub.t-1) ((delta).sup.d) w.p. ((pi).sub.d), (3)

where ((delta).sub.u) and ((delta).sub.d) are constants that denote the upward and downward movements in prices respectively. In this model, which is similar to a random walk model, price realizations in successive periods are correlated. It is representative of a market environment that is non-stationary and evolving (evolutionary) with respect to the prices. The model is a discrete approximation of stochastic models that are traditionally used to represent price processes (28,29).

Under this model of price process, we assume that for short term contracts, (p.sub.t)((y.sub.t),(f.sub.t)) = (p.sub.t), the random

market price. On the other hand, for long term contracts, in the strategic review period the contract is first selected, the purchase price is a function (defined in the contract) of the distribution of the random market price. Thereafter, it is independent of the realizations of the market price, but decreases according to the pre-specified schedule of improvement in the contract. For example, in this paper, we have assumed that when the long term contract is first selected, the purchase price is equal to the expected market price during that period, i.e.,

(p.sub.t)((y.sub.t),(f.sub.t)) = ((pi).sub.u)((p.sup.d).sub.t) when (y.sub.t) = 1.

Alternatively, this relationship may be determined by a different function that reflects the impact of uncertainty on the supplier's profitability (e.g., the supplier may pick price as a fractile of the distribution if he was risk averse). Since we do not focus on the

supplier's operations here, this pricing function is assumed to be exogenous to our model. Clearly, under a long term contract, (p.sub.t)((y.sub.t),(f.sub.t)) is also a function of (delta) (the improvement rate).

Using this notation, the total expected purchase price during the entire strategic review period,

(P.sub.t)((y.sub.t),(f.sub.t)) = (micro)(T.sub.T)(p.sub.t)((y.sub.t),(f.sub.t)).

3.5. Inventory and shortage costs

(C.sub.t)((y.sub.t),(f.sub.t)) denotes the optimal inventory holding and shortage costs during the strategic review period. We denote the holding cost rate per unit per tactical review period by h (= r% of purchase price) and the shortage cost by b. (C.sub.t)((y.sub.t),(f.sub.t)) is affected by the order up to level, s, for the component and the delivery lead time specified in the contract. At the strategic level of planning that we are interested in, we use the shortage cost to capture the target level of customer delivery service (in other formulations, such Agrawal and Cohen (19), service may be specified for orders of finished products). Recall that the second source of uncertainty is the purchase price, which is revealed at the beginning of the strategic review period, after contract selection, but stays constant during the period. Therefore, in our model, inventory is held strictly to meet demand and hedge against demand uncertainty, not for price speculation.

For a given contract and purchase price, the optimal inventory stocking policy and the resulting inventory and shortage cost can be determined by solving the sub-problem shown in Equation 4. Here, (d.sup.(L((y.sub.t))+1)) is the random variable denoting the total demand during L((y.sub.t)) + 1 tactical periods.

(min.sub.s) hE((s - (d.sup.(L((y.sub.t))+1))).sup.+) + bE((d.sup.(L((y.sub.t))+1)) - s).sup.+) . (4)

This formulation resembles the well-known newsboy problem, which is easily solvable.

In this paper, we will assume that the demand for the component within a tactical review period is normally distributed with parameters (micro) and (sigma). We will use the notation (psi) and (psi) to denote the cumulative probability and probability density for a standard normal function. For a given price realization and contract in period t, using standard results from the inventory theory literature, the optimal

inventory and shortage cost is

(T.sub.T) ((sigma)(square root of)L((y.sub.t) + 1 (h + b)(psi)((z.sup.*))),

where

(z.sup.*) = ((psi).sup.-1)(b/h + b).

Thus, the optimal inventory and shortage cost, (C.sub.t)((y.sub.t),(f.sub.t)) can be calculated.

4. Analysis of the contract selection problem

In this section, we will characterize the properties of the optimal solution to the Contract Selection Problem.

As noted earlier, under the assumption of the Binomial price process, component prices are correlated across time periods, and the price of long term contracts depends upon the uncertain market prices. As a result of such non-stationarities, the solution can only be determined numerically. (Readers who are familiar with the literature on financial options markets will recognize that the analysis of the contracts in our model closely resembles that of American call options, which can not, unfortunately, be evaluated using closed form expressions). Therefore, we will discuss the solution through the following illustrative example. Additional implications will be discussed on the basis of sensitivity analysis, in the next section.

Consistent with our observations of the contract selection process often used in practice, we will assume that (T.sub.M) = 5 years, each strategic review period is 1 year long, and a tactical review period is 1 week long. (micro) is assumed to be 23 units per week, and (sigma) is 3.4 units per week. The cost of capital, r is assumed to be 30% per year, and the shortage cost, b is $10 per unit per week. Before the beginning of period 1, the market price is assumed to be $50. The distribution of the market price is assumed to be as follows:

(p.sub.t+1) = {((p.sup.u).sub.t+1) = 1.5 (p.sub.t) w.p. ((pi).sup.u) = 0.5, ((p.sup.d).sub.t+1) = 0.5 (p.sub.t) w.p. ((pi).sup.d) = 0.5.

The two market price realizations are chosen to model a highly volatile market. The effect of changing this degree of uncertainty will be studied later. We assume that the length of the long term contract is 5 years, the replenishment lead time is 2 weeks, and the improvement rate ((delta)) is 0.1 (i.e., total cost reduces by 10% every year). The corresponding values for the short term contract are 1 year, 2 weeks and 0. We assume that when a long term contract is first selected, the price is equal to the mean of the market price in that period. Thereafter, price reduces by a factor of (delta) every year.

Table 1 compares the disutility of costs for the optimal solution to that obtained when only the short or only the long term contract is used for the entire planning horizon. The solutions were derived for three examples with different values of the fixed investment.

Note that when K = $30 000, the optimal strategy is to invest in the long term contract immediately. The benefit due to price certainty and improvement rate of the long term contract outweigh any possible speculative benefit of the short term contract in this case. When K = $90 000, the optimal strategy is to use the short term contract in each period. In this case, the large fixed investment outweighs any benefits possible with the long term contract. When K = $60 000, the optimal solution is contingent on the market price realization. The optimal strategy is to enter into a short term contract at the beginning of the first period. If the higher market price is realized in that period, a long term contract is selected at the beginning of the second period. However, if the lower price is realized, it is best to continue with short term contracts. Intuitively, the expected market price in the future periods is higher if the higher price is realized in the first period (i.e., Equation 3 induces a positive corr elation between prices in successive time periods). Consequently, when that happens, in this example, the benefit of protection from future upside risk that is possible by locking in a fixed price through a long term contract at the beginning of the second period outweighs its fixed investment. This issue is discussed in more detail next.

4.1. Tradeoff between long and short term contracts

In order to understand the nature of the optimal solution in this example, consider Fig. 1 which shows the cumulative probability distribution of the total cost for the strategies discussed in example 2 above. When the long term contract is selected in the very first time period, there is no price related uncertainty in the total cost since the firm locks in a fixed price for the entire horizon (recall that uncertainty in demand in tactical review periods still exists). When the short term contract is used throughout, there is considerable variability in the costs due to the randomness in purchase price (in addition to the uncertainty in demand). The optimal strategy, however, eliminates a considerable amount of variability since the long term contract is selected at the beginning of the second period if the price increases in the first, thereby locking in a fixed price for the rest of the horizon. Therefore, the distribution of cost in the optimal solution exhibits a smaller variability than when a short ter m contract is used throughout. Thus, the risk averse firm in this example prefers the flexibility of a short term contract in period 1, but chooses a long term contract later to reduce the volatility of its cash flows and stabilize its expenses.

While we have used the concept of disutility to measure risk aversion in our analysis, other methods can also be used to evaluate the costs and benefits of contract alternatives. Note that in our model, by choosing a long term contract, while a firm protects itself against any risk associated with price increases in the market, it is unable to take advantage of potential savings resulting from price reductions in the market. Therefore, for a given sourcing strategy Y and a given target cost level Z (e.g., a competitor's cost), one can evaluate the distribution of the resulting costs using measures such as expected up-side risk (EUR(Z, Y)) and expected downside potential (EDP(Z, Y)). Such measures have been used by others (see Huchzermeier and Cohen (29) in the context of global supply chain management), and can be defined as follows:

EUR(Z, Y) = (((integral of).sup.(infinity)).sub.x=Z) Pr{(V.sub.1)((y.sub.0)(Y),(p.sub.0)) = x}(x - Z)dx,

EDP(Z, Y) = (((integral of).sup.Z).sub.x=0) Pr{(V.sub.1)((y.sub.0)(Y),(p.sub.0)) = x}(Z - x)dx.

Here, (V.sub.1) ((y.sub.0)(Y),(p.sub.0)) is the cost incurred if contracts are chosen according to the strategy Y. EUR is the expected amount that the firm pays above the target cost level, and EDP is the expected amount that the firm saves below the target cost level. Clearly, a contract alternative will completely dominate another only if its risk and downside potential dominate for all values of Z. Figure 2 (a and b) shows the up-side risk and downside potential for each of the three supply strategies for different target cost levels. It is interesting to note that no strategy completely dominates over all target levels.

A managerial implication of these observations is that the decision to enter into long term contracts is highly dependent on the nature of the markets and the decision maker's risk attitudes. When the market conditions for components are evolving (non-stationary) over the length of the planning horizon, long term contracts may not be optimal right at the beginning of the planning horizon even for risk averse firms. It may be optimal to delay the decision to switch to the long term contract until more

price realizations have been observed. Thus, a "wait-and-see" strategy may be best suited. Therefore, forecasts of market conditions, i.e., the distribution of market prices over the planning horizon, must be an important input to the supply management decision.

Another way to characterize price in non-stationary markets is by its "drift," which depends upon its distribution over time. For example, in the Binomial model, the drift will be a function of ((delta).sup.u), ((delta).sup.d) and ((pi).sup.u). To illustrate the effect of drift on contract selection, let us suppose that ((delta).sup.u)and ((delta).sup.d) are restricted so that ((delta).sup.u) + ((delta).sup.d) = 2. Then, it can be shown that an upward drift in market prices exists only when ((pi).sup.u) (greater than) 0.5. Intuitively, in this case, we would expect that long term contracts would be preferred if an upward drift exists so that a fixed price can be locked in. However, it is important to realize that the total cost also depends upon other factors such as the fixed expense K, improvement rate (delta) and the decision maker's risk preference (lambda). For the three examples considered earlier, the minimum values of ((pi).sup.u) beyond which the long term contract is selected immediately in period 1 are 0.45, 0.53 and 0.58 for K = $30 000, 60000 and 90 000 respectively. Notice that when K = $30 000, a long term contract may be selected even when a downward drift in price exists. On the other hand, in the other two cases, the long term contract may not be selected even when an upward drift in price exists. Recall that the unit price under the long term contract will be higher when the value of ((pi).sup.u) is higher since the expected market price is higher. Thus, extensive reliance on current contract prices will lead to sub-optimal decisions.

Such observations imply that the tradeoff between fixed investment,

risk preference and improvement rate plays a crucial role in determining the optimal contract. This tradeoff is explored further in Section 5.

4.2. A special case -- Bernoulli price process

A special case of the above price process results when the prices in successive time periods are independent, i.e.,

(p.sub.t) = {((p.sup.u).sub.t) = (p.sup.u) w.p. ((pi).sup.u),

((p.sup.d).sub.t) = (p.sup.d) w.p. ((pi).sup.d).

We refer to this assumption as the Bernoulli price process. It can be used to model the situation where (p.sup.u) and (p.sup.d) represent the most likely best and worst case outcomes in a market environment that is stable (stationary) with respect to the prices of components (which may be a result of a mature technology). Managers often develop such scenarios to conduct analysis of various policies.

This simplified price structure allows the optimal solution to be characterized analytically. In this case, only one decision variable is needed, namely, T, the time period after which a long term contract is selected (and the corresponding order up to level s for each period). To simplify the resulting formulation, we use the superscript L to refer to the long term contract (corresponding to (y.sub.t) = 1), and S the short term contract (corresponding to (y.sub.t) = 0). Superscripts u and d will be used to denote the cases when market prices are high (up) and low (down) respectively. Define

u((V.sup.S)((t.sub.1), (t.sub.2))) = optimal disutility of cost when a short term contract is used during ((t.sub.1) + 1, (t.sub.2));

u((V.sup.L)((t.sub.1), (t.sub.2))) = optimal disutility of cost when a long term contract is used during ((t.sub.1) + 1, (t.sub.2));

u((v.sub.1) (T)) = optimal disutility of cost incurred when a long term contract is first selected at the beginning of period T + 1, {u((v.sub.1)(T)) = u((V.sup.S)(0, T)) + u((V.sup.L)(T, (T.sub.M)))};

(PC.sup.S) = total purchase, inventory and shortage cost incurred in any strategic review period if the short term contract is used;

(PC.sup.L) = total purchase, inventory and shortage cost in the first strategic review period in which the long term contract is used.

Then, from earlier results, the formulation (2) is equivalent to minimizing u((v.sub.1)(T)) with respect to T. Also, it can be shown that

(PC.sup.L) = p(micro) + (T.sub.T)(sigma) (square root of)(L.sup.L) + 1 (h + b)(psi)((z.sup.*))), and, (5)

(MATHEMATICAL EXPRESSION NOT REPRODUCIBEL IN ASCII) (6)

where p is the price under a long term contract when it is first selected. Since there is no purchase price uncertainty under a long term contract, u((PC.sup.L)) = (PC.sup.L). Equations (1) and (6) must be used to calculate u((PC.sup.S)). Therefore, the objective function to be minimized in our optimization problem can be stated as

u((v.sub.1)(T)) = (((sigma).sup.T-1).sub.x=0)(((zeta)).sup.x)u((PC.sup.S)) + (((zeta)).sup.T)(K + ((sigma).sup.(T.sub.M)-T-1).sub.x=0) (((zeta)(1 - (delta))).sup.x)(PC.sup.L).

Using ((zeta).sub.L) = (zeta) x (1 - (delta)) as the effective discount rate for the long term contract, we have

u((V.sub.1)(T)) = u((PC.sup.s)) 1 - (((zeta)).sup.T)/1 - (zeta) +

(((zeta)).sup.T) (K + (PC.sup.L) 1 - ((((zeta).sub.L)).sup.TM-T)/1 - ((zeta).sub.L) (7)

The following result establishes the optimal solution for this case. The proof follows by establishing the shape of the cost function, and is omitted here.

Theorem 1. The optimal time to switch from a short term contract to a long term contract, (T.sup.*), is given as.

(T.sup.*) = {0 if u((V.sup.S)(0,(T.sub.M)))(greater than or equal to)u(V.sup.L)(0,(T.sub.M))),

(infinity) otherwise.

In other words, the optimal solution to the contract selection problem is an extreme point solution, where (T.sup.*), is either 0 or (infinity).

The optimal contract selection policy under this simple case is, therefore, of the form "now-or-never". A long term contract must be selected either right at the beginning, or never. This form of the optimal solution results because the state space for the market prices is stationary and independent across time. Intuitively, if it is not optimal to select a long term contract in period T, it will also not be optimal to do so in any subsequent period since its fixed cost will then be spread over even fewer periods, making it a worse alternative. Thus, when the market conditions for components are stationary over the length of the planning horizon, all decisions regarding sourcing can be made right at the beginning of the horizon.

The strategy implied by this result is consistent with the observation made during our survey of manufacturing firms. We observed that some firms in the chemical and electronics industries are able to make sourcing decisions for products that are stable and mature with respect to prices and technology (e.g., certain minerals, or simple integrated circuit chips). However, often, they hesitate to enter into long term relationships for other products whose markets are in an evolutionary state with respect to technology and prices.

5. Comparative statics and policy implications

In this section, we will discuss some policy implications resulting from an extensive numerical sensitivity analysis of our model (under the Binomial price process assumption). Example 2 discussed in the previous section will be used to illustrate our findings. Since the problem structure is greatly simplified under the assumption of the Bernoulli price process, we will state the corresponding results analytically for this special case. (Proofs of these analytical results are straight forward and therefore omitted). This analysis will; (1) explain the effect of various parameters on the contract selection decisions; and (2) suggest conditions under which long term relationships are appropriate. The results will then be used to suggest a testable hypothesis to explain the observed in-consistencies between supply managers' stated intent to enter into long term relationships, but actual participation in short term contracts.

5.1. Impact of improvement rate

A prime advantage of a long term contract is the improvement in total costs due to cooperation between the buyer and supplier, and supplier learning. However, it is interesting to note that the improvement rate must be above a minimum threshold value in order to justify investments in long term contracts. Further, this threshold value

is a function of other important factors such as the fixed investment, the decision maker's risk preference as well as the uncertainty in the market price.

Figure 3 shows the tradeoff between the improvement rate and the fixed investment for our numerical example. If the improvement rate is low and the fixed investments are high, it is not optimal to use a long term contract at all. If the improvement rate is sufficiently high, it is optimal to select the long term contract immediately to take maximal advantage of cost improvements. For intermediate values of improvement rates and fixed investment, the optimal policy is to delay selecting the long term contract until after observing the market prices. The threshold value of (delta), beyond which the long term contract is selected immediately, increases as the fixed investment increases. These observations offer a plausible explanation for why many managers are slow to invest in long term contracts. It is likely that their estimate of the improvement rate in long term contracts is too low to justify such investments.

Figure 4 illustrates the tradeoff between the improvement rate and the measure of the manager's risk aversion. The graph depicts values of improvement rate for which the optimal strategy is to select only the short-term contract always, the long-term contract immediately, or to "wait-and-see". Note that the more risk averse the decision maker is, the smaller is the threshold value of improvement rate beyond which the long term contract is selected immediately. Consequently, we should expect highly risk averse decision makers to be more inclined toward long term contracts even if the improvement rate is small, so that they can hedge against

price uncertainty.

In a similar manner, we can also show that the threshold value of improvement rate, above which a long term contract is preferred immediately, is smaller when the planning horizon is longer since higher cost savings can be realized in future time periods.

For the special case of the Bernoulli price process, these results can be stated analytically as follows:

Lemma 1. There exists a threshold value for rate of improvement for long term contracts,((delta).sup.*), below which a short term contract will be preferred to long term contracts, i.e.,

(Inverted E) ((delta).sup.*), s.t., u((V.sup.S)(0,(T.sub.M))) (less than or equal to) u(V.sup.L)(0, (T.sub.M))) (For all) (delta)(less than or equal to)((delta).sup.*).

Moreover, ((delta).sup.*) is convex increasing in K, i.e., (delta)((delta).sup.*)/(delta)K(greater than or equal to)0, and ((delta).sup.2)((delta).sup.*)/(delta)(K.sup.2)(greater than or equal to)0, and, ((delta).sup.*)is convex decreasing in (lambda), i.e., (delta)((delta).sup.*)/ (delta)(lambda)(less than or equal to)0, and ((delta).sup.2)((delta).sup.*)/(delta)((lambda).sup.2)(greater than or equal to)0. Also, ((delta).sup.2)((delta).sup.*)/(delta)K(delta)(lambda)(less than or equal to)0.

5.2. Impact of decision maker's risk attitude

The decision maker's risk preferences play a crucial role in determining the outcome of the contract selection process since managers' rewards often depend directly on the immediate cost implications of their decisions. As discussed earlier, one of the reasons for selecting long term contracts is the ability to hedge against price uncertainties. Therefore, the perceived value of fixed price long term contracts is higher when the decision maker is more risk averse. However, our results show that risk attitudes must be carefully balanced against other contract parameters. For example, if the annual improvement rate of long term contracts is not sufficiently high (Fig. 4), short term contracts may be preferred for the entire planning horizon. Even when the risk aversion is high, long term contracts may not be selected immediately - instead, it may be better to wait until prices increase in the market.

Similarly, if the fixed investment required for the long term contract is high, a long term contract may never be selected (Fig. 5). The figure also shows that managers who are more risk averse should be willing to accept long term contracts with larger fixed investments. Finally, the tradeoff between the degree of risk aversion and the uncertainty in market pices must also be carefully considered (Fig. 6). This issue is examined in more detail next.

For the special case of Bernoulli price process assumption, the above discussion can be stated analytically using the results of Lemma 1 as well as the following:

Lemma 2. The threshold value of risk aversion, below which short term contracts are preferred, denoted by ((lambda).sup.*), is linear and non-decreasing in the fixed investment (K). In other words,

(delta)((lambda).sup.*)/(delta)K (greater than or equal to) 0, and ((delta).sup.2)((lambda).sup.*)/(delta)(K.sup.2) = 0.

5.3. Impact of market price uncertainty

The impact of market price uncertainty on sourcing decisions is not very obvious. Market price uncertainty depends upon the values of the market price realizations, the corresponding probabilities, and the price spread. For example, all else being equal, if the value of ((pi).sup.d) (the probability that market price is low) is too low or too high, the risk (due to variance of purchase price) associated with short term contracts is small. However, as the value of ((pi).sup.d) increases, the speculative benefit of short term contracts increases since there is a greater chance of a lower market price. At the same time, as ((pi).sup.d) increases, the average market price decreases, which lowers the price under the long-term contract in our model. This nonlinear tradeoff between the risk and speculative benefit of the short term contract determines whether it is dominated by the long term contract or not.

Figures 6, 7 and 8 illustrate the tradeoff between ((pi).sup.d) and risk aversion, fixed investment and annual improvement rate for the long term contract. Figure 6 shows that for a given value of ((pi).sup.d), as the risk aversion increases, the manager is more likely to select the long term contract. Moreover, the threshold value of risk aversion, below which a long term contract is never selected increases as ((pi).sup.d) increases,

i.e., the speculative benefit of the short term contract dominates below this threshold value. Figure 7 shows that an increase in ((pi).sup.d) leads to a decrease in the threshold value of fixed investment below which a long term contract is selected immediately. In other words, as ((pi).sup.d) decreases, the manager will be willing to select long term contracts with higher fixed investments. Finally, Fig. 8 shows that as ((pi).sup.d) increases, the minimum improvement rate needed to select long term contract immediately also increases. In other words, higher benefits from lon g term contracts are required to outweigh the benefit of the short term contract.

In each case, note that for any given value of ((pi).sup.d), there is a range of values of the fixed investment, risk aversion and improvement rate within which the optimal strategy is "wait-and-see." Further, the width of this range appears to increase as ((pi).sup.d) increases. The effect of changes in the value of market price realizations in any period is determined by a similar tradeoff.

Obviously, sourcing decisions are also affected by the way in which price uncertainty evolves over time. When prices are stationary, as in the special case of the Bernoulli price process, sourcing decisions can be finalized for the entire planning horizon at the beginning. However, when prices are non-stationary, sourcing decisions can change over time, and are price dependent.

The above results results can be summarized as follows for the Bernoulli price process assumption:

Lemma 3. There exists a range for ((pi).sup.d), ((pi),(pi)), where 0 (less than or equal to) (pi) (less than or equal to) (pi) (less than or equal to) 1, such that

u(V.sup.L)(0, (T.sub.M)))(less than equal to)u(V.sup.S)(0, (T.sub.M))) (For all) (pi) (less than or equal to) ((pi).sup.d) (less than or equal to) (pi),

Further, (delta)(pi)/(delta)K (greater than or equal to)0 and (delta)(pi)/(delta)K (less than or equal to)0,
(delta)(pi)/(delta)(lambda)(greater than or equal to)0 and
(delta)(pi)/(delta)(lambda)(greater than or equal to)0, and,
(delta)(pi)/(delta)(delta)(greater than or equal to)0.

Lemma 4. Suppose that (p.sup.u) is kept constant. Then,

(delta)u((V.sup.S) (0, (T.sub.M)))/(delta)(p.sup.d)(greater than or equal to)0 if (((PC.sup.S).sub.u) - ((PC.sup.S).sub.d)) (less than or equal to) 1/2(lambda)(1 - ((pi).sup.d)),

and,

(delta)u((V.sup.S) (0, (T.sub.M)))/(delta)(p.sup.d) (less than or equal to)0 if (((PC.sup.S).sub.u) - ((PC.sup.S).sub.d)) (greater than or equal to) 1/2(lambda)(1 - ((pi).sup.d)),

where, ((PC.sup.s).sub.u) and ((PC.sup.s).sub.d) are obtained from equation 6.

Further, if (p.sup.d*) is the lower market price at which the costs of long and short term contracts are equal, then

(delta)(p.sup.d*)/(delta)K = 1 / (delta)u((V.sup.S) (0, (T.sub.M)))/(delta)(p.sup.d)

5.4. Impact of fixed investments

As the amount of fixed investment increases, the cost of the long term contract increases. However, this does not necessarily make short-term contracts preferable to long-term contracts. Managers must carefully

evaluate the tradeoff between fixed investments and other parameters since in the long run, long term contracts may still be optimal. For example, a long term contract might still be preferred if the improvement rate is sufficiently high (Fig. 3), the decision maker's risk aversion is sufficiently high (Fig. 5), or the probability of market prices being low is sufficiently low (Fig. 7). Thus, managers must not make contract selection decisions based only on the up front fixed expenses.

These results have already been summarized analytically for the Bernoulli assumption of price process in Lemmas 1, 2 and 3.

5.5. Impact of length of planning horizon

Short planning horizons tend to favor short term contracts and discourage switching to long term contracts. Unless planning horizons are at least as long as ((T.sup.*).sub.M), the minimum length of time needed to recover the fixed investments through supplier learning, short term contracts should be preferred. In our example, ((T.sup.*).sub.M) = 5 years, as seen in Fig. 9. When the planning horizon is shorter than 5 years, the long term contract is never optimal. This suggests that if sourcing planning is done for short planning periods, it is less likely for managers to select long term contracts. Further, it can be demonstrated that the value of ((T.sup.*).sub.M) increases when the fixed investment increases, improvement rate decreases, or the decision maker's risk aversion decreases. The following lemma summarizes this result for the special case of the Bernoulli price process.

Lemma 5. There exists a minimum length of planning horizon, ((T.sup.*).sub.M), below which a short term contract will be preferred to long term contracts. In other words,

(Inverted E) ((T.sup.*).sub.M), s.t., u((V.sup.S)(0, (T.sub.M))) (less than or equal to) u((V.sup.L)(0, (T.sub.M))) (For all) (T.sub.M) (less than or equal to) ((T.sup.*).sub.M).

6. Discussion

In this paper, we have formulated a mathematical model of a firm that purchases components from external suppliers. The model has been used to study the tradeoffs between the flexibility and speculative benefit offered by short term contracts and the cost improvements and fixed expenses associated with long term contracts. The approach described in this paper provides a methodology to evaluate the total cost impact of any contracting alternative and insights into the contract selection process. It can, therefore, be incorporated in a more extensive decision support system designed to select optimal contracts and determine the optimal material stocking policies in an integrated fashion.

Our analysis counters some of the assertions made in the business press about the benefits of long term contracts by suggesting that they do not always dominate short term contracts. Despite the cost improvements that are possible when such contracts are used, there is a broad range of conditions under which short term contracts are more cost effective. We have illustrated the tradeoffs between various factors which determine the choice of contracts. These factors include fixed investments, length of the planning horizon, improvement rates for contracts, the decision makers' risk preference, and uncertainty in market

prices.

Thus, even if cost improvements result when a long term contract is used, these benefits might be negated by a high fixed investment or the speculative benefits possible in a volatile market when a short term contract is used. If the decision maker is not very risk averse, the benefit of hedging against price uncertainty (by selecting a long term contract) may be minimal. Similarly, if decisions are made only for a short planning horizon, the cumulative cost savings due to long term contracts may not be sufficient to justify its fixed investment. On the other hand, when a short term contract is chosen, while the prospect of a speculative benefit exists in volatile markets, a risk averse manager might want to forego these benefits and select a long term contract despite the associated fixed expenses. For our stylized model, we have been able to quantify the specific conditions under which firms should prefer long term contracts to short term contracts by numerically studying the underlying tradeoffs.

Another key factor that affects the choice of sourcing arrangements is the nature of price dynamics for components. In non-stationary markets, sourcing decisions are contingent on the market price realization and firms may be better off by delaying investments in long term contracts. On the other hand, in stationary markets, firms can make such decisions at the beginning of their planning horizon for the entire horizon.

The decision maker's attitude towards risk also has a significant impact on the choice of contracts. This implies that an appropriate measurement of risk attitude is important to any methodology to evaluate contract alternatives. Although the "mean-variance" approach used here is simple conceptually, objectively estimating is difficult. Using measures such as expected up-side risk or down-side potential obviates the need for such estimation, but presents a different dilemma. A contract may not completely dominate another with respect to both measures, and the choice of the contract is dependent on the target cost level.

An important implication of our analysis is that supply managers may, in fact, be acting optimally by not investing in long term contracts. This would be true if the business environment perceived by them is such that short term contracts dominate long term contracts. In our survey (2) of supply managers from eight leading manufacturing companies, we noted that the average contract length was only 1 2/3 years, and even these were reviewed frequently. Almost 25% of the contracts were shorter than 6 months, and few were longer than 3 years.

Further discussions revealed a number of interesting insights into their contract selection process. The rewards for most managers are usually based on material acquisition costs incurred during a quarter or 6 month period. Consequently, most managers use very short planning horizons for the purpose of contract selection. Second, contract selection decisions are typically made subjectively without quantifying the total cost. Purchase cost tends to be the primary criteria, and improvement rates are rarely discussed. Shop floor and material control personnel are typically not involved in the contracting process. Consequently, their understanding of the inventory cost implications of contracting decisions is limited. Third,

the process of vendor qualification is tedious, long (up to 25 weeks) and expensive. The contract negotiations can sometimes take up to 60 weeks. Thus, the cost of entering into a long term contract is perceived to be high. Finally, managers often perceive a great degree of uncertainty in co mponent prices (especially in high-technology industries). Following our model's analysis, it is clear that these conditions will tend to favor short term contracts and discourage any investment in long term contracts. Thus, our analysis lends support to our hypothesis that managers may be making optimal decisions by participating in short term contracts despite claims to seek long term contracts. We believe that a detailed empirical investigation to test this hypothesis is a useful next research step. On the other hand, if this hypothesis is not true and managers are, in fact, making suboptimal choices, then our methodology can be used to adopt a total cost-based approach to supplier selection.

Interestingly, some companies are able to obtain the best of both worlds by selecting long term contracts with suppliers who are expected to match the least price that is prevalant in the markets, but are not allowed to pass on cost increases to the buyers (2). Thus, firms are able to pass on all of the risk associated with component price volatility to their suppliers. This suggests that the negotiation power of the buyers is high. Perhaps a slow economy and rising competition from smaller companies that are willing to accept smaller profit margins have allowed these companies to have the upper hand in the relationships.

Our model can be extended in a number of ways. For example, the model could include multiple sourcing of components, in which case, strategies for allocation of purchase volume to different suppliers must also be derived. Second, since the nature of a product's life cycle is an important source of uncertainty in its demand, sensitivity of the supplier selection and order allocation decisions to the nature and stage of a product's life cycle can be explored. Further, by allowing a portfolio of contracts of different lengths (not just short and long term) and the possibility of terminating long term contracts, with an associated penalty, the model can be made more general. A third way to extend this research is by using alternate modeling approaches. As mentioned earlier, the analysis of the contracts in our formulation resembles that of American call options. While such instruments can not be analyzed using closed form expressions, they can be studied analytically using a continuous time approximation of the prices in the form of a Brownian motion (30). We believe that special cases of our problem can be modeled this way. While approximate, such models may permit the derivation of more insights analytically. Finally, we have not made any reference to the factors that affect the supplier's decisions to offer various contract terms. A game theoretic framework that simultaneously considers both the supplier's and the buyer's decisions would be useful.

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Biographies

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in the Operations and Information Management Department of the Wharton School of the University of Pennsylvania. He is also Co-Director of the School's Fishman-Davidson Center for Service and Operations Management. He was a visiting Professor at Stanford University and the Massachussetts Institute of Technology. He holds a B.A.Sc. in Engineering Sciences from the University of Toronto, as well as an M.S. in Industrial Engineering and Management Science and a Ph.D. in Operations Research from Northwestern University. He has been an Area Editor for the Manufacturing, Operations and Scheduling section of Operations Research, and Co-Editor of the Special Issue of Operations Research on "New Directions in Operations Management." He has also served on the editorial boards of the Journal of Operations Management, the Journal of Manufacturing and Operations Management and Naval Research Logistics. He currently is a member of Editorial Advisory Board of Supply Chain Management Review, Journal of Production and Operations Management, and Journal of Manufacturing and Service Operations Management. Dr. Cohen's current research interests include: (1) supply chain strategy; (2) logistics systems for service delivery; (3) concurrent product/technology/supply chain development; and (4) global operations and real options. He also has acted as a consultant to more than 20 multinational companies in the food, computer, automobile, semiconductor, military logistics, process equipment, pharmaceutical, capital equipment leasing, and industrial paper/plastics industries. Dr. Cohen received the 1989 Lauder Institute Prize for Advances in International Management and the Decision Sciences Institute 1991 Hardy Award for best paper. He also was a 1991 Institute of Management Science Practice Competition Award finalist for development of an after sales service logistics system adopted by IBM.

Dr. Narendra Agrawal is an Associate Professor in the Department of Operations and Management Information Systems at the Leavey School of Business, Santa Clara University. He holds an undergraduate degree in Mechanical Engineering from the Institute of Technology, B.H.U., India; an M.S. in Management Science from the University of Texas at Dallas; and an M.A. and Ph. D. in Operations and Information Management from The Wharton School of Business, University of Pennsylvania. He has worked as a Systems Analyst with Tata Consultancy Services in Bombay, India, and has been an instructor at The Wharton School. Dr. Agrawal teaches courses in operations management, computer-based decision models, supply chain management and manufacturing competitiveness. His research interests include supply chain management, sourcing strategy, design and analysis of distribution systems and manufacturing competitiveness. His research papers have appeared in Operations Research, Naval Research Logistics, Production and Operations Management, IIE Transactions, Journal of Retailing, and Agribusiness: An International Journal. He serves on the editorial review boards of Production and Operations Management and the Journal of Operations Management. He is a member of INFORMS.

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Disutility costs for the optimal solution and those for only short and long term contracts

	K	Expected disutility		
		Optimal	Only short term contract	Only long term contract
Example 1	30 000	187 705	225 714	187 705
Example 2	60 000	212 886	225 714	217 705
Example 3	90 000	225 714	225 714	247 705

? t s6/k/26

6/K/26 (Item 2 from file: 148)
Gale Group Trade & Industry DB

How to create your product pricing strategy.

Text:

The Price is Right was a television show that survived for years by giving people a chance to guess the right price for merchandise and services. Many business owners still play this game, but with much higher ...

...I'm going to charge for my items, but, I must admit, most of my prices were set "by Kentucky windage." Is there a more "scientific" way of establishing my prices?

A. "Scientific" might be a stretch, but there surely are a number of important factors you should consider before going to market with a price list. The three most popular approaches -- in order of their use by entrepreneurs -- are cost...

...competition-conditioned. Frankly, any wise entrepreneur should take into account all three techniques before publishing prices.

Most venturers simply try to cover their costs and capture a fair profit. But to...

...like office operations, marketing, utilities, depreciating equipment and interest. You'll have to estimate the volume you will handle for each item in order to allocate the costs appropriately.

Remember, each...

...and variable cost you must add the profit you desire in order to determine the price you'll charge distributors, wholesalers or other end-users. Assuming you want a certain percentage of profit, you can use this formula to determine the wholesale price you should charge (e.g. costs/1.00 - 0.10), if 10 percent is the...

...you start making money. If a product's break-even point is beyond the sales volume you estimate for that piece of merchandise, it would be wise to reconsider offering that product unless, of course, you can whittle down your costs or increase your price. To calculate your break-even point divide your total fixed costs by "contribution per unit" which is your selling price per unit minus, your variable cost per unit.

Here is where you've got to give consideration to the second approach to pricing, which is the market's tolerance for your price. When estimating your market's probable price sensitivity, keep in mind that what the customer is going to be asked to pay a lot more than what you charge the wholesaler or ultimate retailer. The middleman will probably mark up your item another 50 percent to cover his price and profit, and the retailer will most likely double that figure to determine what he...

...business and make a living.

So, if a product leaves your dock with a $5 price tag, the

consumer could be asked to fork over as much as $15 for it. At this price, will it sell? Or will you have to go back and re-jigger your costs...

...even conclude that your gizmo is good enough to demand more than the ultimate sales price you figured. This could very well be the case if your product is unusual. While...
...you'd be leaving some profit on the table if you didn't bump your prices to what the market will tolerate.

If your product is not one-of-a-kind, the third technique for pricing should come into play. Examine the prices of similar or identical products in the market. Here's where strategy is important. If you overestimate your advantages and price above the market, you might create a lasting unfavorable image in customers' minds. If you...

...important market awareness and some market share. But, be careful. You could also start a price war and leave both you and you competitor with less than optimum profit.

Coming in with an "introductory" low-price offer might make the most sense. You won't cause your competitor to over react and you'll be able to bump up your price once you've settled into the market.

Paul Willax is a Professor of Entrepreneurship and...

20000107

? t s6/k/21

6/K/21 (Item 1 from file: 621)
Gale Group New Prod.Annou.(R)

...PaperBuy.com - will be devoted just to paper, tying distributors' actual inventories and customer-specific pricing tables into a real-time order processing system for conventional paper purchases. Between PaperDeals.com...

...paper but no easy means of finding just the right buyer for that type and quantity, PaperDeals gives them an instant outlet to turn it into cash -- in minimum time or for a maximum price. By the same token, shopping a world market for the best deal on a boatload...

...site offers a unique "BuyNow!" and "SellNow" function which the party posting the auction (whether seller-initiated or buyer-initiated) can optionally select. Without it, the natural auction dynamics drive the highest possible price for the seller and lowest possible price for the buyer. The trade-off, however, is time. If a seller wants to move the stock quickly and is willing to sacrifice

the optimum profit, they can do so by disclosing their "SellNow!" price -- anyone who bids that price instantly gets the merchandise.

PaperDeals.com features English and Reverse English (buyer-initiated) auctions, as well as Dutch and Reverse Dutch (in which prices descend with each clock tick, until all units are sold). A small percentage transaction fee is charged to the seller once the auction is successfully closed. The site was built using Moai Technology's LiveExchange...

19990907

? t s6/k/7

6/K/7 (Item 7 from file: 15)
ABI/Inform(R)

Text:

...s special insight. Budgets are adapted to facts that do not show up on paper. Pricing strategies are based on a hunch.

But a number of solutions now exist for putting...

...and into the laptops of every knowledge worker in a company.

Still, where does a distributor start? How does one "add intelligence" to sales and operations? In a survey of wholesale...

...accelerates unprofitablity."

The best place to start to find hidden costs and opportunities for greater profit is by optimizing the retrieval of data so it can be analyzed. We call this "data warehousing," and...

...are included, the net profit margins often vary. Likewise, two customers may buy the same quantities and the same mix of products, but after analyzing the costs of servicing the two...

? t s6/k/4

6/K/4 (Item 4 from file: 15)
ABI/Inform(R)

Price customization

Abstract:

...element of the marketing mix with the greatest degree of missed opportunity for customization is price. Even though firms recognize that different customers place different values on a given product, few do anything about it. Since price customization can yield significant gains in profit - 20% or 50% - it is well worth investigating. The 5 major, innovative techniques for implementing price customization and achieving greater profitability are: 1. multidimensional pricing, 2. quantity discounts, 3. multiperson pricing, 4. price bundling, and 5. product line alternatives. This variety of methods is necessary because of the different cirmcumstances in which pursuing price customization is potentially viable. Although each technique is operationalized somewhat differently, all share the fact that adjusting prices better to individual customers' willingness to pay yields profit improvement.

Text:

...element of the marketing mix with the greatest degree of missed opportunity for customization is price. Sure, many firms distribute coupons knowing that only the more price sensitive customers will redeem them; effectively, this customizes the low price to this segment of the market. But, even though firms recognize that different customers place different values on a given product, few do anything systematic about it. In pricing, the focus is more on cost and "fairness" considerations than on customer valuations. This leads managers to frame the pricing question as "What should the price be?" when the right questions to ask are:

What price should an individual with a specific product valuation pay for the product? What pricing program yields the right set of prices to the customer base with different values for the product?

Charging everyone the same price works well only if customers are not very different from one another. If all prospective buyers of your product value it at $50, then a one-price policy of $50 to all customers is great. You can't do any better. But...

...range from $0-$ 100 with each valuation being equally likely. In this case, a one-price policyeven if you find the best price -misses a great deal of the profit potential.

Lost Profits

Exhibit 1 portrays the relationship between price and number of buyers for the described situation of 100 potential buyers with an average ...

...levels $1, $2, $3,...$99, $100. The demand curve shows that, if we charge any price (p), we will sell 100-p units. Let's arbitrarily pick $20 as our unit...

...our costs. If we have a "oneprice policy" in mind, we have to pick the price between $20 and $100 that maximizes profit.

In Exhibit 1, a price generates a profit amount equal to the area of the rectangle whose width is the distance from the price to the $20 cost and whose height is the number of units to be sold, i.e., the height of the demand curve at the selected price. Any price we pick between $20 and $100 sweeps out a profit rectangle from inside the big triangle. You can charge a high price and get a low but wide rectangle, or charge a low price and get a high but narrow rectangle. For our chosen scenario, a $60 price optimizes the size of the profit rectangle.

However, even the optimal profit rectangle contains only 50% of the large shaded triangle. The price sweeps out a rectangle and leaves behind two triangles. The "money left on the table...

...for $60. The profit opportunity with these evaporates into thin air. For the optimal one-price policy, the two triangles are of the same size. Thus, even the best one-price policy captures only 50% of the profit potential from our value creation efforts. Price customization allows us to get at the profit opportunity in these "left behind" triangles.

The basic idea of price customization is simple: Have people pay prices based on the value they place on the product. Obviously you can't just hang...

...and low-value customers so the "high" buyers can't take advantage of the low price.

There are a number of ways to do this. For example, adults may be able...

...pay $7.50 for a movie and kids only $5. We "fence off' the $5 price by making it available only to those under age 12-an observable characteristic of the buyer. In situations where large-volume buyers value a product less than small-volume buyers, we "fence off ' the low price by making it available only after so many purchases at a higher price. Business flyers value a seat more highly than do pleasure travelers, so we "fence off" the low pleasure travelers' price via a Saturday night stay requirement. This fence does not work perfectly in that some...
...do stay over a Saturday night, but it is still far better than a one-price policy.

Fencing Mechanisms

In our experience, the five major, innovative techniques for implementing price customization and achieving greater profitability are: (1) multidimensional pricing, (2) quantity discounts, (3) multiperson pricing, (4) price bundling, and (5) product line alternatives. This variety of methods is necessary because of the different circumstances in which pursuing price customization is potentially viable. Although each technique is operationalized somewhat differently, all share the fact that adjusting prices better to individual customers' willingness to pay yields profit improvement.

Multidimensional Pricing

In multidimensional pricing, two or more price parameters are used instead of one. For example, consider the case of a firm marketing industrial gases supplied in steel cylinders under high pressure. In a one-dimensional price scheme, gas is sold just on a weight basis at a price of, say, $2 per pound. Each customer pays the same price. Price movements can only be along the one dimension of price per pound and competitive prices are directly comparable. One supplier in this market introduced a multidimensional price scheme by charging a rental fee per day for the steel cylinder while reducing the per-pound price of the gas (see Exhibit 2).

(Graph Omitted)

Captioned as: EXHIBIT I

Customers pay different transaction prices depending on how fast they use the gas: those. who use it fast pay a lower effective price per pound than those who use it slowly. The manufacturer now has more degrees of freedom in managing price because changes can be made along two dimensions. He can now offer the same price plan to all, but it yields higher prices from the slower consumption rate customer. If slower consumption rates go with higher value, the scheme is useful in tapping the value. If the two price components are set correctly, the profit will increase substantially.

A specific example of multidimensional pricing with proven profit impact is the German Railroad Corp.'s (a $15-billion company) 1993 transition from a one- to two-dimensional pricing strategy. The company historically priced transportation between any two points as a simple multiple of the distance between them. However, this price structure was not competitive with driving for many potential riders.

Recognizing this, the company introduced...

...second class. Cardholders can buy tickets at a 50% discount off the standard per-kilometer price. Thus, the price schedule has

two dimensions, the card price and the ticket price (or discount level off the traditional per-kilometer charge). The most important effect is that, once a person has bought the card, its price is a sunk cost. The train or car decision then depends solely on the marginal price per kilometer. With the card, the train is below the marginal cost of a car...

...airline, a so-called "Fly & SaveCard." As Exhibit 3 shows, offering a card in the price range of $5,000 per year and a discount of 20% on tickets purchased would...

...restaurant.

(Graph Omitted)

Captioned as: EXHIBIT 2

(Graph Omitted)
Captioned as: EXHIBIT 3

Setting the price parameters at the right levels requires detailed, valid information on individual customers. Understanding the average...

...using conjoint measurement techniques. Conjoint was appropriate to the task because it allowed assessment of price sensitivity for individual customers. In the airline case, the sample size was 1,000 business class customers. However, the added profit more than justified the cost of the large samples.

Quantity Discounts

Quantity discount schedules involve a discount in price with an increase in number of units purchased by a given customer. The rationale for...

...willingness to pay for successive visits per month. If the theater operator had a one-price per visit plan, the optimal price would be $5.SQ yielding a contribution of $49,000 per month. A much higher contribution of $67,500 is obtained if the price for the first visit is $9, for the second visit $6, the third $5.50, and so on. The right side of Exhibit 4 illustrates that this quantity discount scheme comes much closer to the triangle of maximum profit than the rectangle of uniform price.

These first two types of plans are examples of nonlinear tariffs in that the price paid is not necessarily proportional to the number of units consumed. For nonlinear pricing to be successful, it is critical to know exactly how the "willingness to pay" is...reaction can play a critical role and should, therefore, be carefully anticipated and

observed.

Multiperson Pricing

Multiperson pricing is structurally similar to quantity discounts but involves more than one person. In this case, two (or more) people pay less than a first "full price" customer. The rationale for the discount is that the second person's willingness-to-pay...

...a contribution of $1,000 (assuming variable costs are negligible). Or it can set a price of $600, getting both as passengers and a higher contribution of $1,200. However, a...

...and the contribution goes up to $1,600, a 33% improvement over the best single price of $600.

Multiperson

pricing is also frequently used for larger groups and is increasingly popular in travel, tourism, hotel, conference, sports, and similar industries. Well-founded multiperson pricing requires detailed information on customers' willingness-to-pay both for the individual and the groups...

...the typical profit improvements we observe tend to be in the range of 10%-15%.

Price Bundling

Just as multiperson pricing works across people, bundling works across products. Two or more products are sold together at a price that is less than the sum of their individual prices. In a pure bundling strategy, only the bundle is sold; in a mixed bundling strategy...

...adoption rates were quite sensitive to the discounts for the bundles as compared to the price of options if purchased individually. Bundling also enabled considerable cost reductions because of lower purchasing prices for the components and reduced complexity in logistics and assembly.

Exhibit 5 (see page 16) shows the profit effect of price bundling for various discount rates on all bundles. (Management wanted to price each of the three bundles at the same discount.) The exhibit indexes the profit with...

...options profit increased by 22%.

Recall that differences between customers is the driving force behind price customization. Bundling operates somewhat differently from other schemes because it enhances profitability by reducing the...

...With solid information on an individual's willingness-to-pay, we can determine whether separate pricing (unbundling), pure bundling, or mixed bundling is the best approach. Based on our experience, typical...

...private labels, can respond in several ways. One solution is to adopt an "everyday low pricing"strategy like Procter & Gamble did for some of its products. A second option-and the classical promotional pattern adopted by many consumer goods companies-is to cut prices temporarily to keep aggressors at bay. A third option is to introduce a less expensive...

...label, a private label, or a retailer brand. The most important issue is designing and pricing the LEA to limit cannibalization of the premium brand and foster market share gain for the LEA from the price aggressors.
(Table Omitted)

Captioned as: EXHIBIT 4

For example, a leading manufacturer of lighting products...

...70% cheaper than the premium brand-too directly, thereby preventing retaliation and a further downward price spiral. After two years, this carefully planned and implemented LEA strategy was a success. About...

...the premium brand, but 60% were gained from competing with the Chinese imports. Product and price policy were set together to divide customers properly between the premium brand and the LEA to maximize profitability.

Conclusion

As we have pointed out in these examples, implementation of price customization can yield significant gains in profit-not 2% or 5% but 20% or 50...

...products and the underlying drivers for those evaluations.This information can lead both to proper pricing and product line design. However, one has to be concerned about the perceived "fairness" and legality of the particular price customization plan selected. Fairness perceptions can be managed through communication. For example, hotels in resort...

...at getting us to think in terms of "off-season discounts" rather than "in-season price premiums." With respect to legality, the acid test is whether the plan would have the impact of substantially lessening competition, i.e., does selling at a lower price to one party preclude others from effectively competing. Price customization is not easy. But, in the right circumstances, the potential rewards are great.

(Graph...

...1993) Mass Customization. Boston: Harvard Business School Press.

Simon, H. and R. Dolan (1996) Power Pricing New York: Free Press.

Author Affiliation:

About the Authors

Author Affiliation:

Hermann Simon is Chairman...
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...Inc., a New York Stock Exchange company and consults on issues of product policy and pricing for a wide variety of clients. Bob has testified on behalf of the state of...

...Blue Cross/Blue Shield. He is author or co-author of seven books including Power Pricing, Managing the New Product Development Process, and Marketing Management. More than 600,000 copies of...

Descriptors:
...Pricing policies

? t s6/7/4

6/7/4 (Item 4 from file: 15)
ABI/Inform(R)

01722905 03-73895
USE FORMAT 7 OR 9 FOR FULL TEXT
Price customization

Abstract:

The element of the marketing mix with the greatest degree of missed opportunity for customization is price. Even though firms recognize that different customers place different values on a given product, few do anything about it. Since price customization can yield significant gains in profit - 20% or 50% - it is well worth investigating. The 5

major, innovative techniques for implementing price customization and achieving greater profitability are: 1. multidimensional pricing, 2. quantity discounts, 3. multiperson pricing, 4. price bundling, and 5. product line alternatives. This variety of methods is necessary because of the different cirmcumstances in which pursuing price customization is potentially viable. Although each technique is operationalized somewhat differently, all share the fact that adjusting prices better to individual customers' willingness to pay yields profit improvement.

Text:

(Illustration Omitted)

Marketers today are more precisely matching product and service offerings to the desires of individual customers. Titleist brand offers seven different types of golf balls, allowing an individual to trade-off for distance, "feel," and spin, depending on the type of ball that best suits his or her game. The Coca-Cola Co. has moved from Coca-Cola being its one "anywhere, anytime" drink to a long product line that includes Diet Coke, Caffeine-free Diet Coke, and Cherry Coke. Federal Express offers six different levels of service quality, ranging from same-day to three-day delivery. Through its Web site www.myski.com, Myski offers a customer the chance to custom design a set of skis combining sidecuts, lengths, colors, graphics, and name engraving. Myski describes its factory as being "more like an artist's studio than an automobile assembly plant."

This product customization strategy has boosted profits significantly in many situations because it increases the value a customer perceives in having a relationship with the company. Often product customization is augmented by customization of the supporting communications program because more finely targeted media permit economical delivery of messages tailored to specific audiences.
The element of the marketing mix with the greatest degree of missed opportunity for customization is price. Sure, many firms distribute coupons knowing that only the more price sensitive customers will redeem them; effectively, this customizes the low price to this segment of the market. But, even though firms recognize that different customers place different values on a given product, few do anything systematic about it. In pricing, the focus is more on cost and "fairness" considerations than on customer valuations. This leads managers to frame the pricing question as "What should the price be?" when the right questions to ask are:

What price should an individual with a specific product valuation pay for the product? What pricing program yields the right set of prices to the customer base with different values for the product?

Charging everyone the same price works well only if customers are

not very different from one another. If all prospective buyers of your product value it at $50, then a one-price policy of $50 to all customers is great. You can't do any better. But, consider a situation in which the average value to a customer is $50, but individuals' values range from $0-$ 100 with each valuation being equally likely. In this case, a one-price policyeven if you find the best price-misses a great deal of the profit potential.

Lost Profits

Exhibit 1 portrays the relationship between price and number of buyers for the described situation of 100 potential buyers with an average evaluation of $50, but varying so we have one potential buyer valuing the product at each of the levels $1, $2, $3,...$99, $100. The demand curve shows that, if we charge any price (p), we will sell 100-p units. Let's arbitrarily pick $20 as our unit cost, but the same basic story works through for any cost level. The large shaded triangle (i.e., the area under the demand curve and right of the line vertical at $20) represents the excess of our whole potential buyer group's evaluation over our costs. If we have a "oneprice policy" in mind, we have to pick the price between $20 and $100 that maximizes profit.

In Exhibit 1, a price

generates a profit amount equal to the area of the rectangle whose width is the distance from the price to the $20 cost and whose height is the number of units to be sold, i.e., the height of the demand curve at the selected price. Any price we pick between $20 and $100 sweeps out a profit rectangle from inside the big triangle. You can charge a high price and get a low but wide rectangle, or charge a low price and get a high but narrow rectangle. For our chosen scenario, a $60 price optimizes the size of the profit rectangle.

However, even the optimal profit rectangle contains only 50% of the large shaded triangle. The price sweeps out a rectangle and leaves behind two triangles. The "money left on the table" triangle includes those customers who buy at $60, but would have been willing to pay even more; the "passed-up profit" triangle includes customers who value the product at more than $20, but won't buy it for $60. The profit opportunity with these evaporates into thin air.

For the optimal one-price policy, the two triangles are of the same size. Thus, even the best one-price policy captures only 50% of the profit potential from our value creation efforts. Price customization allows us to get at the profit opportunity in these "left behind" triangles.

The basic idea of price customization is simple: Have people pay prices based on the value they place on the product. Obviously you can't just hang out a sign saying "Pay me what it's worth to you" or "It's $80 if you value it that much but only $40 if you don't." You have to find a way to segment customers by their valuations. In a sense, you have to "build a fence" between high-value customers and low-value customers so the

"high" buyers can't take advantage of the low price.

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Fencing Mechanisms

In our experience, the five major, innovative techniques for implementing price customization and achieving greater profitability are: (1) multidimensional pricing, (2) quantity discounts, (3) multiperson pricing, (4) price bundling, and (5) product line alternatives. This variety of methods is necessary because of the different circumstances in which pursuing price customization is potentially viable. Although each technique is operationalized somewhat differently, all share the fact that adjusting prices better to individual customers' willingness to pay yields profit improvement.

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In multidimensional pricing, two or more price parameters are used instead of one. For example, consider the case of a firm marketing industrial gases supplied in steel cylinders under high pressure. In a one-dimensional price scheme, gas is sold just on a weight basis at a price of, say, $2 per pound. Each customer pays the same price. Price movements can only be along the one dimension of price per pound and competitive prices are directly comparable. One supplier in this market introduced a multidimensional price scheme by charging a rental fee per day for the steel cylinder while reducing the per-pound price of the gas (see Exhibit 2).

(Graph Omitted)

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Customers pay different transaction prices depending on how fast they use the gas: those. who use it fast pay a lower effective price per pound than those who use it slowly. The manufacturer now has more degrees of freedom in managing price because changes can be made along two dimensions. He can now offer the same price plan to all, but it yields higher prices from the slower consumption rate customer. If slower consumption rates go with higher value, the scheme is useful in tapping the value. If the two price components are set correctly, the profit will increase substantially.

A specific example of multidimensional pricing with proven profit impact is the German Railroad Corp.'s (a $15-billion company) 1993 transition from a one- to two-dimensional pricing strategy. The company historically priced transportation between any two points as a simple multiple of the distance between them. However, this price structure was not competitive with driving for many potential riders.

Recognizing this, the company introduced the "BahnCard"at a cost of about $300 per year for first class and $150 for second class. Cardholders can buy tickets at a 50% discount off the standard per-kilometer price. Thus, the price schedule has two dimensions, the card price and the ticket price (or discount level off the traditional per-kilometer charge). The most important effect is that, once a person has bought the card, its price is a sunk cost. The train or car decision then depends solely on the marginal price per kilometer. With the card, the train is below the marginal cost of a car for many. The competitive situation for cardholders has been reversed and strong customer loyalty induced.

With 3.5 million cardholders, the BahnCard has been very successful,

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Another example is the Federal Museum of Arts in Bonn, Germany, which offers an "Artcard" at $80. The card grants unlimited access to exhibitions, a 30% discount on tickets for special events, free public transportation to the museum, and a 10% discount in the museum restaurant.

(Graph Omitted)

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Setting the price parameters at the right levels requires detailed, valid information on individual customers. Understanding the average value across the customer base won't do. In the case of BahnCard, 4,000 customers were interviewed via computer using conjoint measurement techniques. Conjoint was appropriate to the task because it allowed assessment of price sensitivity for individual customers. In the airline case, the sample size was 1,000 business class customers. However, the added profit more than justified the cost of the large samples.

Quantity Discounts

Quantity discount schedules involve a discount in price with an increase in number of units purchased by a given customer. The rationale for this is the fact that, in many situations, the second, third, and more units of a product or service have a lower value to customers than does the first. A good example is the plan offered by a movie theater chain with discounts for successive visits within a month. The number of visits is monitored by means of a card that is issued free at the first visit.

The left side of Exhibit 4 displays three consumer segments-A, B, C-and their willingness to pay for successive visits per month. If the theater operator had a one-price per visit plan, the optimal price would be $5.SQ yielding a contribution of $49,000 per month. A much higher contribution of $67,500 is obtained if the price for the first visit is $9, for the second visit $6, the third $5.50, and so on. The right side of Exhibit 4 illustrates that this quantity discount scheme comes much closer to the triangle of maximum profit than the rectangle of uniform price.

These first two types of plans are examples of nonlinear tariffs in that the price paid is not necessarily proportional to the number of units consumed. For nonlinear pricing to be successful, it is critical to know exactly how the "willingness to pay" is distributed across customers. The rewards for better information can be huge, as the movie theater case illustrates. Profit improvements can well range up to 50%, but competitive reaction can play a critical role and should, therefore, be carefully anticipated and observed.

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Multiperson pricing is structurally similar to quantity discounts but involves more than one person. In this case, two (or more) people pay less than a first "full price" customer. The rationale for the discount is that the second person's willingness-to-pay is less than the first's. For example, consider a couple, one going on a business trip and the other considering tagging along. Let's say the business traveler's willingness to pay is $1,000, and the potentially accompanying spouse's is only $600. The airline has three alternatives. It can charge $1,000 and get only the business traveler, yielding a contribution of $1,000 (assuming variable costs are negligible). Or it can set a price of $600, getting both as passengers and a higher contribution of $1,200. However, a scheme with $1,000 for the first and $600 for the second person (or a bundle of two tickets at $1,600) is much better. Both buy tickets, and the contribution goes up to $1,600, a 33% improvement over the best single price of $600.
Multiperson pricing is also frequently used for larger groups and is increasingly popular in travel, tourism, hotel, conference, sports, and similar industries. Well-founded multiperson pricing requires detailed information on customers' willingness-to-pay both for the individual and the groups involved. In practice, the typical profit

improvements we observe tend to be in the range of 10%-15%.

Price Bundling

Just as multiperson pricing works across people, bundling works

across products. Two or more products are sold together at a price that is less than the sum of their individual prices. In a pure bundling strategy, only the bundle is sold; in a mixed bundling strategy, the individual products are sold separately as well. Bundling is widely used in industries such as fast food, automobiles (with option packages), tourism (air and land portions), information technology and telecommunications. Microsoft's "Office" product is an extremely successful bundling strategy.

In an interesting case from the automobile industry, a manufacturer was considering offering three package options: "comfort," "sports," and "safety." A "value-to-customer" study revealed that adoption rates were quite sensitive to the discounts for the bundles as compared to the price of options if purchased individually. Bundling also enabled considerable cost reductions because of lower purchasing prices for the components and reduced complexity in logistics and assembly.

Exhibit 5 (see page 16) shows the profit effect of price bundling for various discount rates on all bundles. (Management wanted to price each of the three bundles at the same discount.) The exhibit indexes the profit with no bundling (equivalent to discount level = 0%) to 100. As shown, a 21% discount yielded optimal profit. At this level, one third of the profit from options comes from the bundles. In this case, the "comfort" bundle was the most popular package and overall options profit increased by 22%.

Recall that differences between customers is the driving force behind price customization. Bundling operates somewhat differently from other schemes because it enhances profitability by reducing the differences between them. The principle, though, is to find those combinations of goods for which willingness-to-pay varies less across customers than willingness-to-pay for individual items. Willingness-to-pay for one product can be transferred to another product-and thus exploited-through the bundling scheme. As with the other methods discussed earlier, we need a high level of information to apply bundling astutely. With solid information on an individual's willingness-to-pay, we can determine whether separate pricing (unbundling), pure bundling, or mixed bundling is the best approach. Based on our experience, typical profit increases due to bundling are in the range of 15%-25%.

Product Line Alternatives

Premium brands, which are increasingly under attack by aggressive "no-name" products or private labels, can respond in several ways. One solution is to adopt an "everyday low pricing"strategy like Procter & Gamble

did for some of its products. A second option-and the classical promotional pattern adopted by many consumer goods companies-is to cut prices temporarily to keep aggressors at bay. A third option is to introduce a less expensive alternative (LEA) in the form of a second brand, a generic/no name label, a private label, or a retailer brand. The most important issue is designing and pricing the LEA to limit cannibalization of the premium brand and foster market share gain for the LEA from the price aggressors.

(Table Omitted)

Captioned as: EXHIBIT 4

For example, a leading manufacturer of lighting products chose the LEA route against cheap imports from China. The LEA was not only 40% cheaper, but also had a different design, less costly packaging, and was sold by a special sales force through separate channels. Using this strategy, the company avoided attacking the Chinese products-which were 60%-70% cheaper than the premium brand-too directly, thereby preventing retaliation and a further downward price spiral. After two years, this carefully planned and implemented LEA strategy was a success. About 40% of the LEA's sales came from cannibalizing the premium brand, but 60% were gained from competing with the Chinese imports. Product and price policy were set together to divide customers properly between the premium brand and the LEA to maximize profitability.

Conclusion

As we have pointed out in these examples, implementation of price customization can yield significant gains in profit-not 2% or 5% but 20% or 50%-so, it's well worth investigating. However, effective implementation requires indepth investigation of customers' valuation of a product using a variety of techniques, including cost-structure studies, managerial judgments, and surveys. We have found conjoint measurement to be an especially useful tool for valuation of products and the underlying drivers for those evaluations.This information can lead both to proper pricing and product line design. However, one has to be concerned about the perceived "fairness" and legality of the particular price customization plan selected. Fairness perceptions can be managed through communication. For example, hotels in resort areas have done a good job at getting us to think in terms of "off-season discounts" rather than "in-season price premiums." With respect to legality, the acid test is whether the plan would have the impact of substantially lessening competition, i.e., does selling at a lower price to one party preclude others from effectively competing. Price customization is not easy. But, in the right circumstances, the potential rewards are great.

(Graph Omitted)

Captioned as: EXHIBIT 5

Reference:

Additional Reading

Reference:

Green, P. and V. Srinivasan (1990). "Conjoint Analysis in Marketing," Journal of MArketing (October 3-19)

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Author Affiliation:
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More than 600,000 copies of his case studies have been distributed by Harvard Business School Case Services.

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Price customization

Abstract:

The element of the marketing mix with the greatest degree of missed opportunity for customization is price. Even though firms recognize that different customers place different values on a given product, few do anything about it. Since price customization can yield significant gains in profit - 20% or 50% - it is well worth investigating. The 5 major, innovative techniques for implementing price customization and achieving greater profitability are: 1. multidimensional pricing, 2. quantity discounts, 3. multiperson pricing, 4. price bundling, and 5. product line alternatives. This variety of methods is necessary because of the different cirmcumstances in which pursuing price customization is potentially viable. Although each technique is operationalized somewhat differently, all share the fact that adjusting prices better to individual customers' willingness to pay yields profit improvement.

Text:

(Illustration Omitted)

Marketers today are more precisely matching product and service offerings to the desires of individual customers. Titleist brand offers seven different types of golf balls, allowing an individual to trade-off for distance, "feel," and spin, depending on the type of ball that best suits his or her game. The Coca-Cola Co. has moved from Coca-Cola being its one "anywhere, anytime" drink to a long product line that includes Diet Coke, Caffeine-free Diet Coke, and Cherry Coke. Federal Express offers six different levels of service quality, ranging from same-day to three-day delivery. Through its Web site www.myski.com, Myski offers a customer the chance to custom design a set of skis combining sidecuts, lengths, colors, graphics, and name engraving. Myski describes its factory as being "more like an artist's studio than an automobile assembly plant."

This product customization strategy has boosted profits significantly in

many situations because it increases the value a customer perceives in having a relationship with the company. Often product customization is augmented by customization of the supporting communications program because more finely targeted media permit economical delivery of messages tailored to specific audiences.

The element of the marketing mix with the greatest degree of missed opportunity for customization is price. Sure, many firms distribute coupons knowing that only the more price sensitive customers will redeem them; effectively, this customizes the low price to this segment of the market. But, even though firms recognize that different customers place different values on a given product, few do anything systematic about it. In pricing, the focus is more on cost and "fairness" considerations than on customer valuations. This leads managers to frame the pricing question as "What should the price be?" when the right questions to ask are:

What price should an individual with a specific product valuation pay for the product? What pricing program yields the right set of prices to the customer base with different values for the product?

Charging everyone the same price works well only if customers are not very different from one another. If all prospective buyers of your product value it at $50, then a one-price policy of $50 to all customers is great. You can't do any better. But, consider a situation in which the average value to a customer is $50, but individuals' values range from $0-$ 100 with each valuation being equally likely. In this case, a one-price policyeven if you find the best price-misses a great deal of the profit potential.

Lost Profits

Exhibit 1 portrays the relationship between price and number of buyers for the described situation of 100 potential buyers with an average evaluation of $50, but varying so we have one potential buyer valuing the product at each of the levels $1, $2, $3,...$99, $100. The demand curve shows that, if we charge any price (p), we will sell 100-p units. Let's arbitrarily pick $20 as our unit cost, but the same basic story works

through for any cost level. The large shaded triangle (i.e., the area under the demand curve and right of the line vertical at $20) represents the excess of our whole potential buyer group's evaluation over our costs. If we have a "oneprice policy" in mind, we have to pick the price between $20 and $100 that maximizes profit.

In Exhibit 1, a price generates a profit amount equal to the area of the rectangle whose width is the distance from the price to the $20 cost and whose height is the number of units to be sold, i.e., the height of the demand curve at the selected price. Any price we pick between $20 and $100 sweeps out a profit rectangle from inside the big triangle. You can charge a high price and get a low but wide rectangle, or charge a low price and get a high but narrow rectangle. For our chosen scenario, a $60 price optimizes the size of the profit rectangle.
However, even the optimal profit rectangle contains only 50% of the large shaded triangle. The price sweeps out a rectangle and leaves behind two triangles. The "money left on the table" triangle includes those customers who buy at $60, but would have been willing to pay even more; the "passed-up profit" triangle includes customers who value the product at more than $20, but won't buy it for $60. The profit opportunity with these evaporates into thin air.

For the optimal one-price policy, the two triangles are of the same size. Thus, even the best one-price policy captures only 50% of the profit potential from our value creation efforts. Price customization allows us to get at the profit opportunity in these "left behind" triangles.

The basic idea of price customization is simple: Have people pay prices based on the value they place on the product. Obviously you can't just hang out a sign saying "Pay me what it's worth to you" or "It's $80 if you value it that much but only $40 if you don't." You have to find a way to segment customers by their valuations. In a sense, you have to "build a fence" between high-value customers and low-value customers so the "high" buyers can't take advantage of the low price.

There are a number of ways to do this. For example, adults may be able and willing to pay $7.50 for a movie and kids only $5. We "fence off' the $5 price by making it available only to those under age 12-an observable characteristic of the buyer. In situations where large-volume buyers value a product less than small-volume buyers, we "fence off ' the low price by making it available only after so many purchases at a higher price. Business flyers value a seat more highly than do pleasure travelers, so we "fence off" the low pleasure travelers' price via a Saturday night stay requirement. This fence does not work perfectly in that some business people do stay over a Saturday night, but it is still far better than a one-price policy.

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(Graph Omitted)

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Customers pay different transaction prices depending on how fast they use the gas: those. who use it fast pay a lower effective price per pound than those who use it slowly. The manufacturer now has more degrees of freedom in managing price because changes can be made along two dimensions. He can now offer the same price plan to all, but it yields higher prices from the slower consumption rate customer. If slower consumption rates go with higher value, the scheme is useful in tapping the value. If the two price components are set correctly, the profit will increase substantially.

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(Table Omitted)

Captioned as: EXHIBIT 4

For example, a leading manufacturer of lighting products chose the LEA route against cheap imports from China. The LEA was not only 40% cheaper, but also had a different design, less costly packaging, and was sold by a special sales force through separate channels. Using this strategy, the company avoided attacking the Chinese products-which were 60%-70% cheaper

than the premium brand-too directly, thereby preventing retaliation and a further downward price spiral. After two years, this carefully planned and implemented LEA strategy was a success. About 40% of the LEA's sales came from cannibalizing the premium brand, but 60% were gained from competing with the Chinese imports. Product and price policy were set together to divide customers properly between the premium brand and the LEA to maximize profitability.

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Additional Reading

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Price Management, Goodwill and Marketing Strategy, "Simon for Managers," Pricing Strategies for New Products, Effective Personnel Marketing, Thinking Management-Companies with Vision (in Japanese and Korean), Hidden Champions-Lessons from 500 of the World's Best Unknown Companies, and Power Pricing. His articles and books have been published in 15 languages. As a member of the Supervisory Boards and Trustee of numerous corporations and foundations, Hermann has gained wide experience in corporate governance. He has been a consultant to major corporations throughout the world such as Siemens, Mercedes-Benz, General Motors, Hewlett Packard, Glaxo-Wellcome, Kodak, and Shell.

Author Affiliation:
Robert J. Dolan is the Edward W. Carter Professor of Business Administration at Harvard Business School where he teaches marketing in the Advanced Management Program for senior executives and in the MBA Program. He serves on the Board of Directors of Knoll Inc., a New York Stock Exchange company and consults on issues of product policy and pricing for a wide variety of clients. Bob has testified on behalf of the state of Minnesota as an expert witness on marketing practices in the state's case against the tobacco companies. The case resulted in payment of $6.5 billion to the state and Minnesota Blue Cross/Blue Shield. He is author or co-author of seven books including Power Pricing, Managing the New Product Development Process, and Marketing Management. More than 600,000 copies of his case studies have been distributed by

Harvard Business School Case Services.

THIS IS THE FULL-TEXT.

Simon, Hermann; Dolan, Robert J
Marketing Management v7n3 pp: 10-17 Fall 1998 ISSN: 1061-3846 Journal Code: MMA
Document Type: Journal article Language: English Length: 8 Pages Word Count: 3340

? t s6/k/2

6/K/2 (Item 2 from file: 15)
ABI/Inform(R)

Text:

...with their feet" and take their business elsewhere. Similarly, if a retailer cannot compete on price consumers will very quickly be aware of this failing and transfer their loyalty. Customer expectations...

...has allowed them to mitigate this by putting increased pressure on manufacturers to cut their prices. However, manufacturers cannot continue to produce lower and lower prices. Hence retailers have begun to look internally to try to find efficiencies in their own...

...procedures of a partner. For example, if a manufacturer decides to increase a minimum order quantity or the number of cases on a pallet, the wholesaler or retailer needs to be able to assess what effect this will have on his...

...more than simply forecasting and replenishment, good inventory management is the management of inventory to optimize service and profit. It should include the use of sophisticated business modelling techniques to understand the precise effects of changes in stockholding policies or lead times or shipping quantities. We need to determine what are good economic order quantities, taking into account all aspects of the supply chain, and set the appropriate service level...retail outlets or restaurants tends not to be as good as at major retailers. The wholesaler or food-service company investing in sophisticated systems to be able to offer a VMI...

...of press coupons delivering 30 per cent uplifts at best. In the UK, where half-price promotions are often advertised, 1,000 per cent uplifts are not uncommon. Furthermore, in UK...

? d s

Set Items Description

S1 79831588 S PD<20001016

S2 8393 S ((OPTIMIZE OR OPTIMIZES OR OPTIMIZED OR OPTIMUM OR OPTIMALLY OR OPTIMIZING OR OPTIMIZATION)(5N)(PROFIT OR PROFITABLITY))

S3 1260 S S2 AND (PRICE OR PRICES OR PRICING) AND (QUANTITY OR QUANTITIES OR VOLUME)

S4 437 S S3 AND (SELLER OR SUPPLIER OR DISTRIBUTOR OR WHOLESALER)

S5 77 S S1 AND S4

S6 63 RD (unique items)

? s (maximize or maximizes or maximized or maximizing or maximum or maximally or best or highest or most)(5n)(profit or profits or profitability)

Processing

Processing

Processing

Processing

Processing

Processing

Processing

Processing

1066059 MAXIMIZE

123600 MAXIMIZES

86684 MAXIMIZED

355980 MAXIMIZING

3680147 MAXIMUM

31379 MAXIMALLY

18523225 BEST

4850409 HIGHEST

35019416 MOST

7366658 PROFIT

5326305 PROFITS

2141974 PROFITABILITY

S7 303539 S (MAXIMIZE OR MAXIMIZES OR MAXIMIZED OR MAXIMIZING OR MAXIMUM OR MAXIMALLY OR BEST OR HIGHEST OR MOST)(5N)(PROFIT OR PROFITS OR PROFITABILITY)

? s (supplier or seller or vendor or supply)(3n)(quantity or volume or discount??? or prici???)(3n)(level or levels or tier or tiers or threshold or thresholds)

Processing

Processing

Processing

Processing

Processing

Processing

Processing

2985336 SUPPLIER

781105 SELLER

1627847 VENDOR

7658525 SUPPLY

1302524 QUANTITY

6132989 VOLUME

2950218 DISCOUNT???

3584708 PRICI???

15015407 LEVEL

7794182 LEVELS

897402 TIER

113701 TIERS

895046 THRESHOLD

149932 THRESHOLDS

S8 2618 S (SUPPLIER OR SELLER OR VENDOR OR SUPPLY)(3N)(QUANTITY OR VOLUME OR DISCOUNT??? OR PRICI???)(3N)(LEVEL OR LEVELS OR TIER OR TIERS OR THRESHOLD OR THRESHOLDS)

? s s7 and s8 and 1

Stop request submitted

303539 S7

2618 S8

62712742 1

S9 44 S S7 AND S8 AND 1

? s s1 and s7 and s8

79831588 S1

303539 S7

2618 S8

S10 12 S S1 AND S7 AND S8

? t s10/free/all

>>>W: "FREE" is not a valid format name in file(s): 347-349

10/8/1 (Item 1 from file: 15)
ABI/Inform(R)

02268712 107611
Global marketing: Pricing for a single market

1992
Company Names:
EC
Geographic Names: Europe

Descriptors: Strategic planning; Pricing policies; Price level changes; Organization development; Globalization; Foreign exchange; Economic planning; EC single market
Classification Codes: 9175 (CN=Western Europe); 3500 (CN=Foreign exchange administration); 2500 (CN=Organizational behavior); 1300 (CN=International trade & foreign investment); 1120 (CN=Economic policy & planning)
Print Media ID: 11846

10/8/2 (Item 2 from file: 15)
ABI/Inform(R)

01829242 04-80233
USE FORMAT 7 OR 9 FOR FULL TEXT
Managed care and the questionable relevance of Maricopa
Word Count: 20996 Length: 62 Pages
Spring 1999
Geographic Names: US

Descriptors: Antitrust laws; Supreme Court decisions; Managed care; Effects; Federal court decisions
Classification Codes: 4300 (CN=Law); 8320 (CN=Health care industry); 9190 (CN=United States)

10/8/3 (Item 3 from file: 15)
ABI/Inform(R)

01721864 03-72854
USE FORMAT 7 OR 9 FOR FULL TEXT
The Toyota group and the Aisin fire
Word Count: 8048 Length: 11 Pages
Fall 1998
Company Names:
Toyota Motor Corp (Duns: 69-056-4737 Ticker: TOYOY)
Geographic Names: Japan

Descriptors: Case studies; Automobile industry; Vendor supplier relations; Fires; Contingency planning
Classification Codes: 9179 (CN=Asia & the Pacific); 9110 (CN=Company specific); 8680 (CN=Transportation

equipment industry); 7400 (CN=Distribution); 2310 (CN=Planning)

10/8/4 (Item 4 from file: 15)
ABI/Inform(R)

01499646 01-50634
USE FORMAT 7 OR 9 FOR FULL TEXT
Redefining value: The hamburger price war
Word Count: 6949 Length: 12 Pages
Jun 1997
Company Names:
McDonalds Corp (Duns: 04-153-4264 Ticker: MCD)
Taco Bell (Duns: 00-965-7149)
Wendys International Inc (Duns: 05-285-6671 Ticker: WEN)
Burger King Corp (Duns: 00-414-5645)
Geographic Names: US

Descriptors: Fast food industry; Competition; Market shares; Advertising campaigns; Market strategy; Pricing policies; Discounts; Consumer behavior; Product quality; Case studies
Classification Codes: 9190 (CN=United States); 8380 (CN=Hotels & restaurants); 7000 (CN=Marketing); 9110 (CN=Company specific)

10/8/5 (Item 5 from file: 15)
ABI/Inform(R)

00950713 96-00106
USE FORMAT 7 OR 9 FOR FULL TEXT
1994 - The year in review (Part III)
Word Count: 19010 Length: 17 Pages
Nov 28, 1994
Geographic Names: US

Descriptors: Manycompanies; Value added resellers; Distributors
Classification Codes: 9190 (CN=United States); 8303 (CN=Wholesale industry); 8302 (CN=Software and computer services)

10/8/6 (Item 1 from file: 148)
Gale Group Trade & Industry DB

11324058 Supplier Number: 55683855 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Aggregation and the measurement of technological and market structure: the case of the U.S. meatpacking industry.

August , 1999

Word Count: 4081 Line Count: 00342
Industry Codes/Names: AGRI Agriculture, Fishing and Tobacco; BUSN Any type of business
Descriptors: Packing houses--Economic aspects; Cost (Economics)--Research
File Segment: TI File 148

10/8/7 (Item 2 from file: 148)
Gale Group Trade & Industry DB

07755760 Supplier Number: 16762759 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Delivery minimums. (cost of distribution of beer) (1994 Statistical Report)

March 13 , 1995
Word Count: 2332 Line Count: 00178
Industry Codes/Names: FOOD Food, Beverages and Nutrition
Descriptors: Brewing industry--Distribution; Beer--Distribution; Distribution of goods-- Finance
Product/Industry Names: 5181000 (Beer Wholesale)
Product/Industry Names: 5181 Beer and ale
File Segment: TI File 148

10/8/8 (Item 3 from file: 148)
Gale Group Trade & Industry DB

06210509 Supplier Number: 13691386 (USE FORMAT 7 OR 9 FOR FULL TEXT)
A model of the BFH payments system.

Oct , 1992
Word Count: 6787 Line Count: 00533

Special Features: illustration; graph
Industry Codes/Names: REG Business, Regional
Descriptors: Payment--Models; Monetary policy--Research
File Segment: TI File 148

10/8/9 (Item 4 from file: 148)
Gale Group Trade & Industry DB

05926464 Supplier Number: 13857027 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Pricing for a single market. (EC Common Market)

Summer , 1992
Word Count: 2852 Line Count: 00230
Industry Codes/Names: BUS Business, General

Descriptors: European Community--Economic policy; Pricing--International aspects
Geographic Codes: ZEEC
Geographic Names: European Community
File Segment: TI File 148

10/8/10 (Item 1 from file: 20)
Dialog Global Reporter

12837863 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Daily Financial Report for 11 Sep 00

September 11, 2000
Word Count: 8212
Company Names: Central Bank of the Russian Federation
Descriptors: Market Reports; Market News; Gold & Foreign Exchange Reserves; Economic Indicators; Economic News; Report & Accounts; Results; Company News
Country Names/Codes: Russia (RU)
Regions: Commonwealth of Independent States; Former USSR
SIC Codes/Descriptions: 6011 (Federal Reserve Banks)
Naics Codes/Descriptions: 52111 (Monetary Authorities - Central Bank)

10/8/12 (Item 1 from file: 635)
Business Dateline(R)

0256408 92-02674
Berger Hospital Ranks Among Most Profitable

Publication Date: 911209
Word Count: 1,002
Dateline: Circleville, OH, US

Company Names: Berger Hospital, OH, US, SIC:8062,
Classification Codes: 8320 (Health care industry)
Descriptors: Hospitals; Rankings; Profits; North Central
Special Feature: Chart

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>>>W:  "FREE" is not a valid format name in file(s): 347-349
```

10/8/12 (Item 1 from file: 635)
Business Dateline(R)
(c) 2008 ProQuest Info&Learning. All rights reserved.
0256408 92-02674
Berger Hospital Ranks Among Most Profitable

Publication Date: 911209
Word Count: 1,002
Dateline: Circleville, OH, US

Company Names: Berger Hospital, OH, US, SIC:8062,
Classification Codes: 8320 (Health care industry)
Descriptors: Hospitals; Rankings; Profits; North Central
Special Feature: Chart

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?  s (optimum or optimal or optimally or optimize or optimizes or optimized or optimizing
or optimization)(5n)(group or grouping or combination or combinations)(5n)(buyers or
purchasers or consumers or bidders)

Processing

Processing

Processing

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       773721   OPTIMUM
      1110621   OPTIMAL
       133865   OPTIMALLY
       784359   OPTIMIZE
       113273   OPTIMIZES
       685581   OPTIMIZED
       333769   OPTIMIZING
       783053   OPTIMIZATION
     28330324   GROUP
       225547   GROUPING
      4785261   COMBINATION
       885642   COMBINATIONS
      2404193   BUYERS
       347878   PURCHASERS
      5567799   CONSUMERS
       413555   BIDDERS
```

S11 267 S (OPTIMUM OR OPTIMAL OR OPTIMALLY OR OPTIMIZE OR OPTIMIZES OR OPTIMIZED OR OPTIMIZING OR OPTIMIZATION)(5N)(GROUP OR GROUPING OR COMBINATION OR COMBINATIONS)(5N)(BUYERS OR PURCHASERS OR CONSUMERS OR BIDDERS)

? s s1 and s11

79831588 S1

267 S11

S12 77 S S1 AND S11

? d s

Set Items Description

S1 79831588 S PD<20001016

S2 8393 S ((OPTIMIZE OR OPTIMIZES OR OPTIMIZED OR OPTIMUM OR OPTIMALLY OR OPTIMIZING OR OPTIMIZATION)(5N)(PROFIT OR PROFITABLITY))

S3 1260 S S2 AND (PRICE OR PRICES OR PRICING) AND (QUANTITY OR QUANTITIES OR VOLUME)

S4 437 S S3 AND (SELLER OR SUPPLIER OR DISTRIBUTOR OR WHOLESALER)

S5 77 S S1 AND S4

S6 63 RD (unique items)

S7 303539 S (MAXIMIZE OR MAXIMIZES OR MAXIMIZED OR MAXIMIZING OR MAXIMUM OR MAXIMALLY OR BEST OR HIGHEST OR MOST)(5N)(PROFIT OR PROFITS OR PROFITABILITY)

S8 2618 S (SUPPLIER OR SELLER OR VENDOR OR SUPPLY)(3N)(QUANTITY OR VOLUME OR DISCOUNT??? OR PRICI???)(3N)(LEVEL OR LEVELS OR TIER OR TIERS OR THRESHOLD OR THRESHOLDS)

S9 44 S S7 AND S8 AND 1

S10 12 S S1 AND S7 AND S8

S11 267 S (OPTIMUM OR OPTIMAL OR OPTIMALLY OR OPTIMIZE OR OPTIMIZES OR OPTIMIZED OR OPTIMIZING OR OPTIMIZATION)(5N)(GROUP OR GROUPING OR COMBINATION OR COMBINATIONS)(5N)(BUYERS OR PURCHASERS OR CONSUMERS OR BIDDERS)

S12 77 S S1 AND S11

? s s12 and s7

77 S12

303539 S7

S13 1 S S12 AND S7

? t s13/k/1

13/K/1 (Item 1 from file: 15)
ABI/Inform(R)

Abstract:

...concept of the 2nd-best core, which is a subset of the set of zero-profit, 2nd-best Pareto-optimal prices, is introduced.
Prices are set so that no group of consumers subsidizes the purchase of another group. The relations among the 2nd-best core and sustainability...

? s s8 and s12

2618 S8

77 S12

S14 0 S S8 AND S12

? t s13/7/1

13/7/1 (Item 1 from file: 15)
ABI/Inform(R)

00327000 86-27414
Second-Best Pricing and Cooperation

Abstract:

Pricing for natural monopolies is examined through the use of a cooperative game of joint production. The concept of the 2nd-best core, which is a subset of the set of zero-profit, 2nd-best Pareto-optimal prices, is introduced. Prices are set so that no group of consumers subsidizes the purchase of another group. The relations among the 2nd-best core and sustainability, supportability, and natural monopoly are explored. For specific preferences and technology, the existence of the 2nd-best core is demonstrated. A market mechanism is designed for franchise allocation, which accomplishes 2nd-best pricing without price regulation. It is shown that sustainable prices need not be in the 2nd-best core and that 2nd-best core prices need not be sustainable. A franchise competition is described in which the regulator does not permit consumers to split their purchases among different producers. A firm will win the franchise if, and only if, it offers consumers a price vector in the 2nd-best core.

Spulber, Daniel F.
Rand Journal of Economics v17n2 pp: 239-250 Summer 1986 ISSN: 0741-6261 Journal Code: BEL
Document Type: Journal article Language: English Length: 12 Pages

? s s12 and s2

77 S12

8393 S2

S15 0 S S12 AND S2

? d s

Set Items Description

S1 79831588 S PD<20001016

S2 8393 S ((OPTIMIZE OR OPTIMIZES OR OPTIMIZED OR OPTIMUM OR OPTIMALLY OR OPTIMIZING OR OPTIMIZATION)(5N)(PROFIT OR PROFITABLITY))

S3 1260 S S2 AND (PRICE OR PRICES OR PRICING) AND (QUANTITY OR QUANTITIES OR VOLUME)

S4 437 S S3 AND (SELLER OR SUPPLIER OR DISTRIBUTOR OR WHOLESALER)

S5 77 S S1 AND S4

S6 63 RD (unique items)

S7 303539 S (MAXIMIZE OR MAXIMIZES OR MAXIMIZED OR MAXIMIZING OR MAXIMUM OR MAXIMALLY OR BEST OR HIGHEST OR MOST)(5N)(PROFIT OR PROFITS OR PROFITABILITY)

S8 2618 S (SUPPLIER OR SELLER OR VENDOR OR SUPPLY)(3N)(QUANTITY OR VOLUME OR DISCOUNT??? OR PRICI???)(3N)(LEVEL OR LEVELS OR TIER OR TIERS OR THRESHOLD OR THRESHOLDS)

S9 44 S S7 AND S8 AND 1

S10 12 S S1 AND S7 AND S8

S11 267 S (OPTIMUM OR OPTIMAL OR OPTIMALLY OR OPTIMIZE OR OPTIMIZES OR OPTIMIZED OR OPTIMIZING OR OPTIMIZATION)(5N)(GROUP OR GROUPING OR COMBINATION OR COMBINATIONS)(5N)(BUYERS OR PURCHASERS OR CONSUMERS OR BIDDERS)

S12 77 S S1 AND S11

S13 1 S S12 AND S7

S14 0 S S8 AND S12

S15 0 S S12 AND S2

? S (OPTIMUM OR OPTIMAL OR OPTIMALLY OR OPTIMIZE OR OPTIMIZES OR OPTIMIZED OR OPTIMIZING OR OPTIMIZATION)(5N)(GROUP OR GROUPING OR COMBINATION OR COMBINATIONS)(5N)(pric???)(5n)(quantity or quantities or volume)

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773721 OPTIMUM

1110621 OPTIMAL

133865 OPTIMALLY

784359 OPTIMIZE

113273 OPTIMIZES

685581 OPTIMIZED

333769 OPTIMIZING

783053 OPTIMIZATION

28330324 GROUP

225547 GROUPING

4785261 COMBINATION

885642 COMBINATIONS

23691621 PRIC???

1302524 QUANTITY

962739 QUANTITIES

6132989 VOLUME

S16 76 S (OPTIMUM OR OPTIMAL OR OPTIMALLY OR OPTIMIZE OR OPTIMIZES OR OPTIMIZED OR OPTIMIZING OR OPTIMIZATION)(5N)(GROUP OR GROUPING OR COMBINATION OR COMBINATIONS)(5N)(PRIC???)(5N)(QUANTITY OR QUANTITIES OR VOLUME)

? s s1 and s16

79831588 S1

76 S16

S17 22 S S1 AND S16

? s s17 and (profit or profits or margin or margins or cost or costs)

Stop request submitted

22 S17

7366658 PROFIT

5326305 PROFITS

2475493 MARGIN

2039266 MARGINS

17876047 COST

11922156 COSTS

S18 22 S S17 AND (PROFIT OR PROFITS OR MARGIN OR MARGINS OR COST OR COSTS)

? S S17 AND (profitability or PROFIT OR PROFITS OR MARGIN OR MARGINS OR COST OR COSTS)

22 S17

2141974 PROFITABILITY

7366658 PROFIT

5326305 PROFITS

2475493 MARGIN

2039266 MARGINS

17876047 COST

11922156 COSTS

S19 22 S S17 AND (PROFITABILITY OR PROFIT OR PROFITS OR MARGIN OR MARGINS OR COST OR COSTS)

? t s19/free/all

>>>W: "FREE" is not a valid format name in file(s): 347-349

19/8/1 (Item 1 from file: 15)
ABI/Inform(R)

01673685 03-24675
USE FORMAT 7 OR 9 FOR FULL TEXT
The lobster claw effect phenomena of economic contraction in the individual firm
Word Count: 2384 Length: 11 Pages
Mar 1998

Descriptors: Studies; Economic models; Corporate profits; Demand
Classification Codes: 9130 (CN=Experimental/Theoretical); 1130 (CN=Economic theory); 3100 (CN=Capital & debt management)

19/8/2 (Item 2 from file: 15)
ABI/Inform(R)

00395147 88-11980
How to Use a Microcomputer Simulation to Determine Order Quantity
Length: 4 Pages
Fourth Quarter 1987

Descriptors: Microcomputers; Simulation; Order quantity; Inventory management; Optimization; Algorithms; Models
Classification Codes: 5330 (CN=Inventory management); 5240 (CN=Software & systems); 9130 (CN=Experimental/Theoretical)

19/8/3 (Item 3 from file: 15)
ABI/Inform(R)

00257608 84-36171
An Economic Model of OPEC Coalition
Length: 10 Pages
Oct 1984
Company Names:
OPEC

Descriptors: Economic models; Economic theory; Coalitions; Cartels
Classification Codes: 9170 (CN=Non-US); 1130 (CN=Economic theory); 9130 (CN=Experimental/Theoretical); 9178 (CN=Middle East)

19/8/4 (Item 4 from file: 15)
ABI/Inform(R)

00161130 82-02691
Preference Structure and Piecemeal Second Best Policy
Length: 17 Pages
Oct 1981

Descriptors: Prices; Marginal costs; Pricing policies; Preferences; Consumers; Utility; Functions; Demand; Consumer behavior
Classification Codes: 7100 (CN=Market research)

19/8/5 (Item 1 from file: 9)
Business & Industry(R)

01266440 Supplier Number: 23907125

(USE FORMAT 7 OR 9 FOR FULLTEXT)
Motorola aims PowerPC at low end -- Two MPC850 devices have reduced cache sizes, fewer serial channels, and cost less than MPC860s

May 26, 1997
Word Count: 477
Company Names: MOTOROLA INC
Industry Names: Electronic components; Semiconductors
Product Names: Integrated circuits NEC (367465)
Concept Terms: All product and service information; Product introduction
Geographic Names: North America (NOAX); United States (USA)

19/8/6 (Item 1 from file: 275)
Gale Group Computer DB(TM)

01395338 Supplier Number: 12042122
Combined optimal price and optimal inventory replenishment policies when a sale results in increase in demand. (Technical)

Dec , 1991

Special Features: illustration; graph; program
Descriptors: Supply; Demand; Mathematical Models; Algorithm Analysis; Inventory Control; Pricing Policy; Decision-making
File Segment: TI File 148

19/8/7 (Item 1 from file: 621)
Gale Group New Prod.Annou.(R)

02466870 Supplier Number: 61709647 (USE FORMAT 7 FOR FULLTEXT)
Intraware Announces Electronic Volume Licensing For Microsoft and Symantec Products.

April 3 , 2000
Word Count: 882
Publisher Name: PR Newswire Association, Inc.
Company Names: *Intraware Inc.; Microsoft Corp.; Symantec Corp.
Product Names: *7372000 (Computer Software); 7372510 (Software Development Tools); 7372680 (Internet Software)
Industry Names: BUS (Business, General); BUSN (Any type of business)
SIC Codes: 7372 (Prepackaged software)
NAICS Codes: 51121 (Software Publishers)
Ticker Symbols: ITRA; MSFT; SYMC

19/8/8 (Item 1 from file: 613)

PR Newswire

00303481 20000403LAM078 (USE FORMAT 7 FOR FULLTEXT)
Intraware Announces Electronic Volume Licensing for Microsoft And Symantec Products

Monday , April 3, 2000 07:01 EDT
Word Count: 895

19/8/9 (Item 1 from file: 16)
Gale Group PROMT(R)

07264543 Supplier Number: 61709647 (USE FORMAT 7 FOR FULLTEXT)

Intraware Announces Electronic Volume Licensing For Microsoft and Symantec Products.
April 3 , 2000
Word Count: 882
Publisher Name: PR Newswire Association, Inc.
Company Names: *Intraware Inc.; Microsoft Corp.; Symantec Corp.
Product Names: *7372000 (Computer Software); 7372510 (Software Development Tools); 7372680 (Internet Software)
Industry Names: BUS (Business, General); BUSN (Any type of business)
SIC Codes: 7372 (Prepackaged software)
NAICS Codes: 51121 (Software Publishers)
Ticker Symbols: ITRA; MSFT; SYMC
Special Features: LOB; COMPANY

19/8/10 (Item 2 from file: 16)
Gale Group PROMT(R)

05048863 Supplier Number: 47411557 (USE FORMAT 7 FOR FULLTEXT)

Motorola aims PowerPC at low end -- Two MPC850 devices have reduced cache sizes, fewer serial channels, and cost less than MPC860s
May 26 , 1997
Word Count: 493
Publisher Name: CMP Publications, Inc.
Company Names: *Motorola Inc.
Event Names: *336 (Product introduction)
Geographic Names: *1USA (United States)
Product Names: *3573291 (Computer Peripheral Interfaces)
Industry Names: BUSN (Any type of business); CMPT (Computers and Office Automation); ELEC (Electronics)
NAICS Codes: 334119 (Other Computer Peripheral Equipment Manufacturing)
Ticker Symbols: MOT
Special Features: COMPANY

19/8/11 (Item 1 from file: 148)
Gale Group Trade & Industry DB

12171911 Supplier Number: 62162657 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Diagrammatic Approach to Capacity - Constrained Price Discrimination.

April , 2000
Word Count: 4251 Line Count: 00341
Descriptors: Pricing--Models; Business enterprises--Prices and rates; Profit-- Models
Geographic Codes: 1USA United States
File Segment: TI File 148

19/8/12 (Item 2 from file: 148)
Gale Group Trade & Industry DB

12021482 Supplier Number: 61709647 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Intraware Announces Electronic Volume Licensing For Microsoft and Symantec Products.

April 3 , 2000
Word Count: 960 Line Count: 00093
Company Names: Intraware Inc.; Microsoft Corp.; Symantec Corp.
Industry Codes/Names: BUS Business, General; BUSN Any type of business
Descriptors: Computer software industry
Product/Industry Names: 7372000 (Computer Software); 7372510 (Software Development Tools); 7372680 (Internet Software)
Product/Industry Names: 7372 Prepackaged software
NAICS Codes: 51121 Software Publishers
Ticker Symbols: ITRA; MSFT; SYMC
File Segment: NW File 649

19/8/13 (Item 3 from file: 148)
Gale Group Trade & Industry DB

11324054 Supplier Number: 55683851 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Producer organizations, bargaining, and asymmetric information.

August , 1999
Word Count: 3857 Line Count: 00343
Industry Codes/Names: AGRI Agriculture, Fishing and Tobacco; BUSN Any type of business
Descriptors: Agriculture, Cooperative--Research; Producer cooperatives--Research
File Segment: TI File 148

19/8/14 (Item 4 from file: 148)

Gale Group Trade & Industry DB

10172328 Supplier Number: 20414514 (USE FORMAT 7 OR 9 FOR FULL TEXT)
The effect of profit regulations on combined two-part and peak-load pricing.

Sep , 1997
Word Count: 6912 Line Count: 00568
Industry Codes/Names: BUSN Any type of business; INTL Business, International
Descriptors: Corporate profits--Economic aspects; Pricing--Economic aspects; Public utilities--Economic aspects
Product/Industry Names: 9914170 (Pricing Policy); 4900000 (Electric, Gas & Water Utilities)
Product/Industry Names: 4900 ELECTRIC, GAS, AND SANITARY SERVICES
File Segment: TI File 148

19/8/15 (Item 5 from file: 148)
Gale Group Trade & Industry DB

09009672 Supplier Number: 18685743 (USE FORMAT 7 OR 9 FOR FULL TEXT)
The capital budgeting process: incentives and information. (includes appendix)

Sep , 1996
Word Count: 16160 Line Count: 01391

Special Features: illustration; table; graph
Industry Codes/Names: BANK Banking, Finance and Accounting; BUSN Any type of business
Descriptors: Capital budget--Research; Incentives (Business)--Research; Information management--Research
File Segment: MC File 75

19/8/16 (Item 6 from file: 148)
Gale Group Trade & Industry DB

06802192 Supplier Number: 15142874 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Information sharing in credit markets. (includes appendix)

Dec , 1993
Word Count: 10060 Line Count: 00792

Special Features: illustration; table; graph
Industry Codes/Names: BANK Banking, Finance and Accounting
Descriptors: Credit bureaus--Research; Commercial loans--Research; Loans, Personal-- Research
Product/Industry Names: 7323 Credit reporting services
File Segment: MC File 75

19/8/17 (Item 7 from file: 148)
Gale Group Trade & Industry DB

05311102 Supplier Number: 12042122
Combined optimal price and optimal inventory replenishment policies when a sale results in increase in demand. (Technical)

Dec , 1991

Special Features: illustration; graph; program
Industry Codes/Names: CMPT Computers and Office Automation
Descriptors: Supply and demand--Models; Pricing--Models; Inventory control--Models; Decision-making--Models
File Segment: TI File 148

19/8/18 (Item 1 from file: 20)
Dialog Global Reporter

10377376 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Intraware Announces Electronic Volume Licensing For Microsoft and Symantec Products

April 03, 2000
Word Count: 891
Company Names: Symantec Corp; Microsoft Corp; Intraware Inc
Descriptors: New Products & Services; Marketing; Company News; Contracts & New Orders; Production
Country Names/Codes: United States of America (US)
Regions: Americas; North America; Pacific Rim
Province/State: California
SIC Codes/Descriptions: 7371 (Computer Programming Services); 7372 (Prepackaged Software)
Naics Codes/Descriptions: 54151 (Computer Systems Design & Related Services); 51121 (Software Publishers)

19/8/22 (Item 1 from file: 635)
Business Dateline(R)

0208037 91-38666
Expect Economy to Start Summer Recovery

Publication Date: 910323
Dateline: Toronto, ONT, Canada
Classification Codes: 1110 (Economic conditions & forecasts)
Descriptors: Economic conditions; Economic forecasts; Canada
Special Feature: Photo

>>>W: "FREE" is not a valid format name in file(s): 347-349

19/8/22 (Item 1 from file: 635)
Business Dateline(R)

0208037 91-38666
Expect Economy to Start Summer Recovery

Publication Date: 910323
Dateline: Toronto, ONT, Canada
Classification Codes: 1110 (Economic conditions & forecasts)
Descriptors: Economic conditions; Economic forecasts; Canada
Special Feature: Photo

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>>>W:  "FREE" is not a valid format name in file(s): 347-349
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19/8/22 (Item 1 from file: 635)
Business Dateline(R)
(c) 2008 ProQuest Info&Learning. All rights reserved.
0208037 91-38666
Expect Economy to Start Summer Recovery

Publication Date: 910323
Dateline: Toronto, ONT, Canada
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Descriptors: Economic conditions; Economic forecasts; Canada
Special Feature: Photo

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>>>W:  "FREE" is not a valid format name in file(s): 347-349
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19/8/22 (Item 1 from file: 635)
Business Dateline(R)
(c) 2008 ProQuest Info&Learning. All rights reserved.
0208037 91-38666
Expect Economy to Start Summer Recovery

Publication Date: 910323
Dateline: Toronto, ONT, Canada
Classification Codes: 1110 (Economic conditions & forecasts)
Descriptors: Economic conditions; Economic forecasts; Canada

Special Feature: Photo

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?  t s19/k/17
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19/K/17 (Item 7 from file: 148)
Gale Group Trade & Industry DB

Abstract: ...when it does not create increased demand for the product because the discount would lower profit, but when a discount will increase demand, buyers must determine the amount of discount to... ...an inventory item are considered, and a procedure is developed for determining the buyer's optimal price and ordering policies for combinations of the supplier's sale period and buyer's on-hand quantities. In some instances a special order improves the effectiveness of the buyer's inventory system.
19911200

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?  t s19/k/4
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19/K/4 (Item 4 from file: 15)
ABI/Inform(R)

Abstract:

...If preferences are pseudo-separable, then the marginal rates of substitution between commodities in a group depends only on the quantity of goods consumed within that group and on the level of utility. Since, at the optimum, the consumer equates marginal rates of substitution to price ratios, price changes in one sector will affect consumption in the other sector only through their effect...

Descriptors:
...Marginal costs;

?